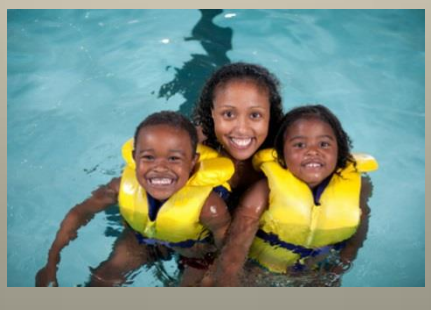
A report of child deaths in Kentucky for the 2012 calendar year, using data files from the Public Health Office of Vital Statistics

Public Health Child Fatality Review Program 2014 Annual Report

Child Fatality and Injury Prevention Program
Division of Maternal and Child Health
Kentucky Department for Public Health



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This report may be viewed at the following web address: http://chfs.ky.gov/dph/mch/cfhi/childfatality.htm

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ACKNOWLEDGEMENTS

The Kentucky Child Fatality Review Program 2014 Annual Report is prepared by the Department for Public Health (DPH) Child Fatality Review and Injury Prevention Program pursuant to Kentucky Revised Statute (KRS) 211.684. The Department for Public Health would like to acknowledge the time and effort of many individuals who contributed toward the completion of this 2014 Annual Report. Data used in this report is for the year 2012, which is the latest year of completed Vital Statistics records that are available. The data is still preliminary and numbers could change.

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Thanks to all members and consultants of the State Child Fatality Review team who volunteer their time and efforts to reviewing this data and reducing child fatalities across the state.

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THE PUBLIC HEALTH CHILD FATALITY REVIEW PROCESS

CHILD FATALITY REVIEW USES SURVEILLANCE TO INFORM PREVENTION EFFORTS

The goal of the Kentucky Department for Public Health's Child Fatality Review (CFR) Program is ultimately to decrease child deaths through prevention efforts. This is done by monitoring aggregate data from vital statistics in order to identify trends and emerging issues related to fatalities that may be preventable in Kentucky. In collaboration with key partners, this data analysis is applied to the development of recommendations and community interventions that may help prevent future injuries and child deaths.

The Kentucky Department for Public Health established, through legislation, the State Child Fatality Review Team in 1996. In accordance with KRS 211.684, the state team is a voluntary, multidisciplinary body that may assume certain duties, including:

- Facilitating the development of local child fatality review teams, which may include training opportunities and technical assistance;
- Developing and distributing model protocols for local child fatality review teams that investigate child fatalities;
- Reviewing and approving local protocols prepared and submitted by local teams;
- Analyzing data regarding child fatalities to identify trends, patterns and risk factors;
- Evaluating the effectiveness of adopted prevention and intervention strategies; and
- Making recommendations regarding state programs, legislation, administrative regulations, policies, budgets, and treatment and service standards, which may facilitate the development of strategies for the prevention and reduction of the number of child deaths.

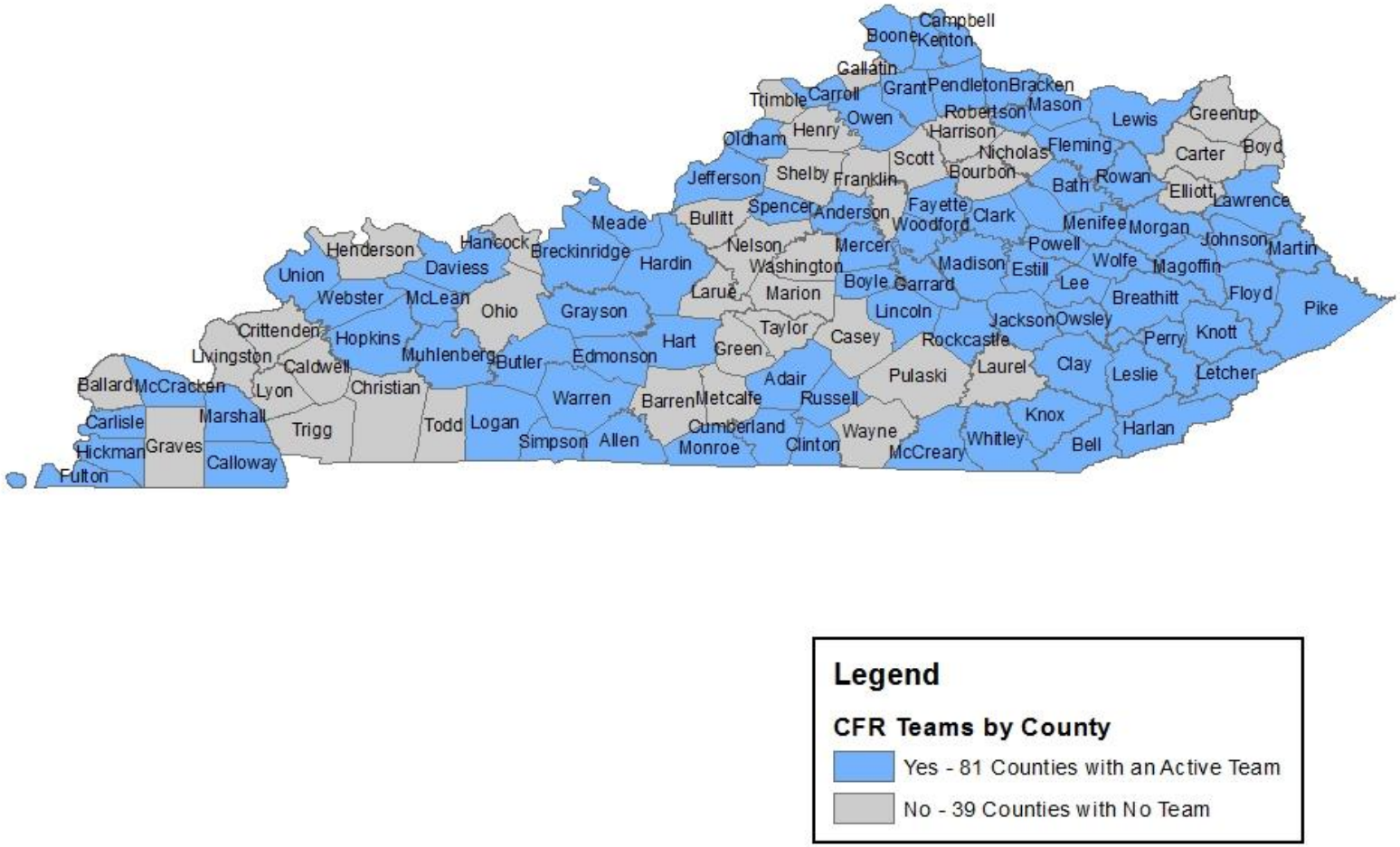
The State Child Fatality Review Program supports the State Child Fatality Review team who work to assure a strong child fatality review and injury prevention system throughout Kentucky. Local development of child fatality review teams, who review child deaths at the local level, continues to be one of the most important infrastructure-building responsibilities of the state team. According to KRS 211.686, local child fatality review team composition includes multidisciplinary representation from coroners, law enforcement, health departments, Department for Community Based Services, Commonwealth and county attorneys, medical professionals, and others deemed important by the local team to carry out its purpose.

The Local Child Fatality Review team is called together by the coroner and assists the coroner in gathering as much information as possible to determine the most accurate manner and cause of a child's death. Team members have the opportunity to share information, discuss and prioritize child health and risk factors, and promote local education and community-based prevention programs. The goal of the program is to have local teams in every county so that local initiatives for injury prevention can be implemented. Currently, 81 counties have an active local child fatality review team (Map 1). The state team reviews all death data collected by the program to identify injury trends occurring in multiple communities and develop strategies that will help save the lives of children across the Commonwealth.

Per KRS 211.684**,** the Public Health Child Fatality Review Program prepares an annual report that includes a statistical analysis of the incidence and causes of child fatalities in the Commonwealth and recommendations for action. This report does not include any information which would identify specific child fatality cases but is an analysis of trends in the data with a focus on opportunities for prevention. This 2014 Child Fatality Review Annual Report presents information from vital statistics data on child deaths from calendar year 2012 (the most recent year with completed data from the Kentucky Office of Vital Statistics). The data is still preliminary and numbers could change. The data was reviewed by the State CFR team and recommendations were developed. Although data in this report is through 2012, activities outlined in the report are current.

Map 1.

Local Child Fatality Review Teams, as of July 2014



Legend

CFR Teams by County

Yes - 81 Counties with an Active Team

No - 39 Counties with No Team

Trends in Deaths Among Kentucky Children

There were a total of 618 deaths among Kentucky children in 2012, which is an increase from the previous year. While the death rate among Kentucky's children has varied from year to year, overall there has been a decreasing trend in childhood deaths from 2005 to 2012. Table 1 shows the number of deaths by age group since 2005.

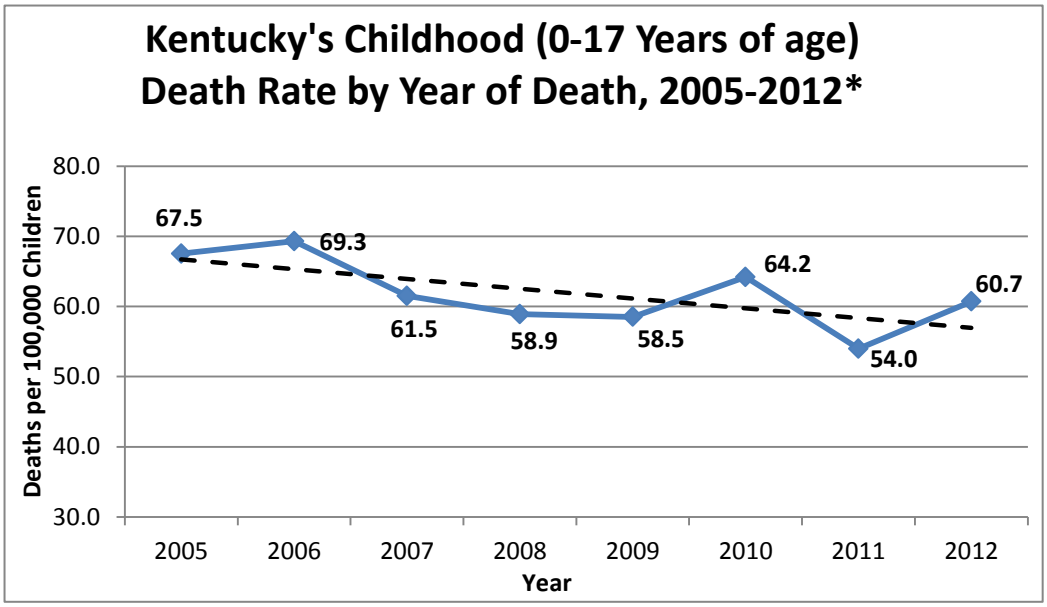
Table 1.

Child Deaths by Age Group and Year, 2005-2012*								
Age Group	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**
Infants	398	450	383	351	364	394	349	391
1-9 Years	122	114	93	102	107	119	109	104
10-17 Years	158	137	149	149	127	144	94	123
Total Number of Deaths	**678**	**701**	**625**	**602**	**598**	**657**	**552**	**618**

***Note: 2009-2012 data are preliminary and may change**
Data Sources: Kentucky Vital Statistics, Death Certificate Files 2005-2012; Additional deaths identified through KY Medicaid Claims Data Warehouse for Years 2010-2012.

Chart 1 reveals the decline in the rates of child deaths, which is the number of deaths adjusted for the population of children that age. In comparing 2005 to 2012, Kentucky's overall childhood death rate for children birth to 17 years of age has decreased from a rate of 67.5 per 100,000 in 2005 to 60.7 per 100,000 in 2012. This overall decline is depicted in the chart.

Chart 1.



***Note: 2009-2012 data are preliminary and may change**
Data Source: Kentucky Vital Statistics, Death Certificate Files 2005-2012; Additional deaths identified through KY Medicaid Claims Data Warehouse for Years 2010-2012; Kentucky State Data Center, Population Estimates 2005-2012.

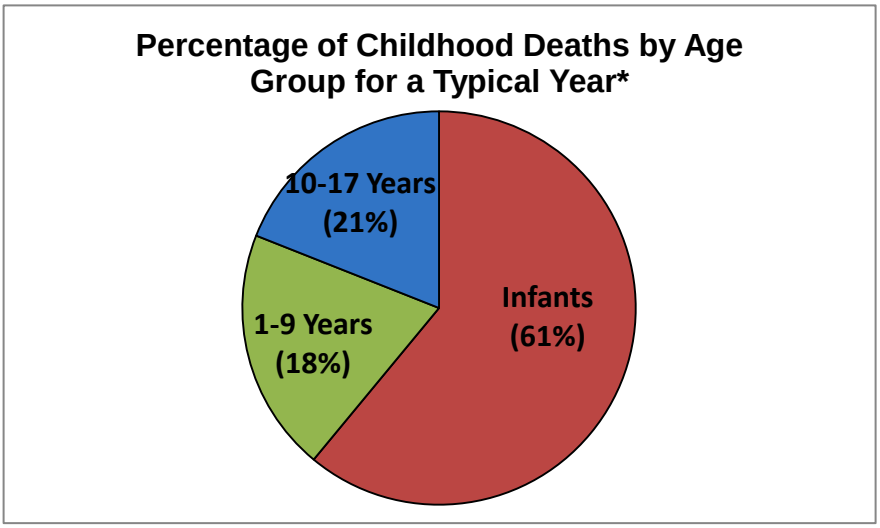
Number of Child Deaths by Age

Infant Deaths. The largest number of child deaths occurs among infants, as illustrated on Chart 2. Infant deaths or infant mortality (deaths occurring before the first birthday) totaled 391 for 2012. On average, infant deaths represent 61% of all child deaths in Kentucky for a year. The majority of infant deaths are from medical conditions such as prematurity, congenital anomalies (birth defects), infections, and diseases. For 2012, the infant mortality rate in Kentucky was 7.3 per 1,000 live births.

Deaths among Young Children ages 1-9.

The total number of deaths for the 1-9 year-old age group has shown no significant changes in the last seven years. In a typical year, this age group comprises 18% of all child deaths. Motor vehicle collisions are the leading cause of death among young children nationally as well as in Kentucky[25]. Deaths from medical conditions and natural causes (birth defects, cancer) are the next leading causes of death among children in this age group as seen in Table 2, on page 5. Potentially preventable deaths (from fires, homicides, and drowning) may also occur among children ages 1-9, although the numbers of these deaths are small.

Chart 2.



***Note:** A typical year is determined by taking the average number of deaths for each age group by cause for 2005 through 2012 combined.
Data Source: Kentucky Vital Statistics, Death Certificate Files 2005-2012; Additional deaths identified through KY Medicaid Claims Data Warehouse for Years 2010-2012.

Deaths among 10-17 Year-Olds

Since 2005, the trend in deaths among children ages 10-17 years has been decreasing. Chart 2 illustrates that in a typical year in Kentucky, 21% of all child deaths occur among children ages 10-17 years. Motor vehicle collisions remain the leading cause of death among Kentucky's older children. The second leading cause of death in 2012 among this age group was suicide, and deaths related to cancer were the third leading cause. Motor vehicle collisions and suicide are both potentially preventable and will be explored later in this report.

Causes of Death by Age Group

Looking at the leading causes of child deaths, there are few significant changes from one year to the next. In order to analyze the leading causes by age, the number of child deaths from multiple years (2005-2012) were used to determine the average of each cause by age group in Kentucky for a typical year. The numbers are provided in Table 2.

Kentucky mirrors the nation in that most child deaths occur among infants (children under the age of 1). The majority of these infant deaths are classified as non-injury and are related to medical conditions and prematurity. The three leading causes of infant deaths in a typical year, as shown in Table 2, are prematurity related conditions, congenital anomalies, and Sudden Unexpected Infant Death (SUID).

In deaths among children older than 1 year of age, the majority of deaths are injury related. These deaths are significant as they have the potential to be prevented. Motor vehicle collision deaths are the most common cause of death for children ages 1-9 and 10-17.

Table 2.

Average Leading Causes of Death among Kentucky's Children by Age Group for a Typical Year*

Cause of Death	*Infants*	*1-9 Years*	*10-17 Years*	*Total*
Prematurity Related Conditions	*105*	*0*	*0*	***105***
Birth Defects	*73*	*10*	*3*	***86***
SUID[α]	*85*	*0*	*0*	***85***
Motor Vehicle Collision	*1*	*18*	*47*	***66***
Perinatal Conditions	*41*	*1*	*0*	***42***
Circulatory Disease	*8*	*5*	*7*	***20***
Cancer	*1*	*13*	*11*	***25***
Disease of the Nervous System	*5*	*7*	*7*	***19***
Homicide	*4*	*8*	*7*	***19***
Suicide	*0*	*0*	*15*	***15***
Disease of the Respiratory System	*8*	*4*	*3*	***15***
Drowning	*0*	*9*	*5*	***14***
Fire	*1*	*9*	*3*	***13***
Suffocation	*8*	*2*	*3*	***13***
Infectious Disease	*7*	*4*	*1*	***12***
Metabolic Disorder	*4*	*3*	*3*	***10***
Poisoning	*1*	*1*	*4*	***6***
Undetermined	*0*	*4*	*1*	***5***
Other[∞]	*29*	*23*	*15*	***67***
Total	***381***	***121***	***135***	***637***

***Note:** A typical year is determined by taking the average number of deaths for each age group by cause for 2005 through 2012 combined.

[α]**Note:** SUID Category includes only deaths due to infants (<1 year of age) where the cause of death was coded as SIDS (R95), Accidental Suffocation in Bed (W75), Undetermined (R99), Other specified threats to breathing (W83), and Unspecified threat to breathing (W84).

[∞]**Note:** Other includes causes of death that varied over the time period and did not have enough data to qualify for a leading cause category.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2005-2012; Additional deaths identified through KY Medicaid Claims Data Warehouse for Years 2010-2012

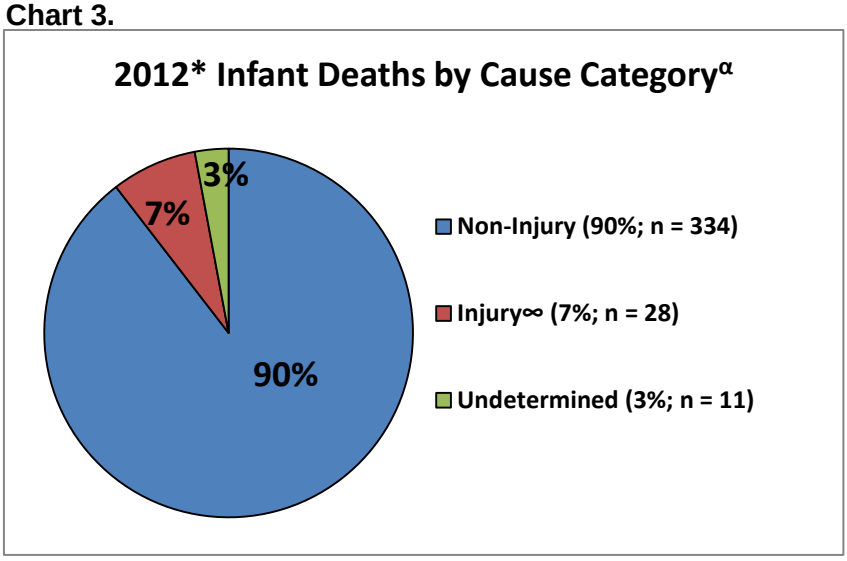
TAKING A CLOSER LOOK
Categories of Child Deaths

The Two Major Categories of Childhood Deaths

The Centers for Disease Control and Prevention (CDC) group deaths into two major categories according to the cause of death, injury or non-injury.

- **Non-Injury Deaths** include causes of death which are the result of natural processes such as disease, prematurity, or congenital anomalies (birth defects). Non-injury deaths in children after the first year of life are usually related to specific health conditions, such as cancer or infections.
- **Injury Deaths** - include, but are not limited to: suffocation, poisoning, drowning, fire, suicide, homicide (including child abuse), and vehicular collisions. Injury deaths account for nearly one in every four child deaths in Kentucky. For child deaths after the first year of life, the focus of this report is injury deaths because they are potentially preventable.

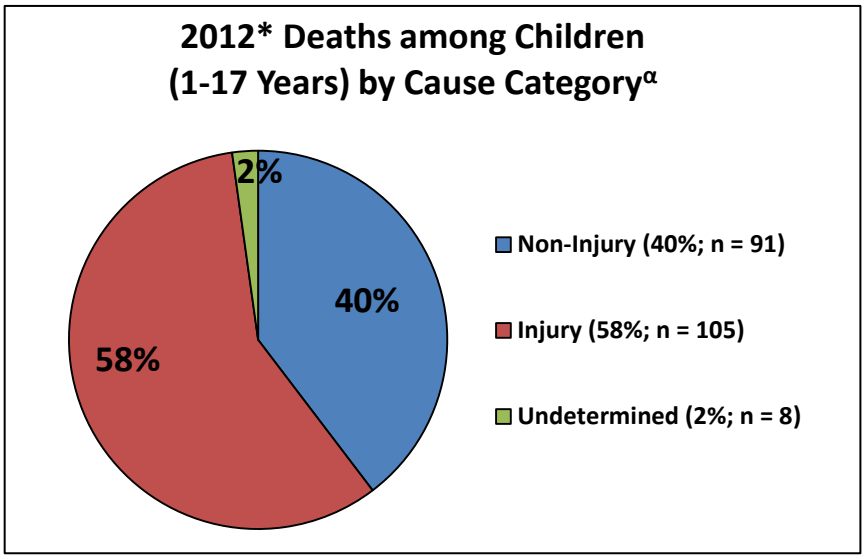
Chart 3.



NOTE: 18 INFANT DEATHS WERE EXLCUDED FROM ANALYSIS BECAUSE OF MISSING CAUSE OF DEATH
***Note: 2012 data are preliminary and may change**
α**Note:** There was no statistically significant difference in the percentage of deaths by cause categories for 2012 compared to previous years
∞**Note:** The "Injury" category includes: Accidental suffocation in bed, Other unspecified threats to breathing, Homicide, Exposure to forces of nature, Motor vehicle collisions, and Poisoning
Data Source: Kentucky Vital Statistics, Death Certificate Files 2012; Additional deaths identified through KY Medicaid Claims Data Warehouse for 2012

Chart 3 shows the 2012 data for *infant* deaths. Injury related causes contributed to only 7% of infant deaths in Kentucky, while 90% were attributed to non-injury deaths such as prematurity and SUID and 3% were classified as undetermined. In contrast, Chart 4 shows that 58% of deaths among *children ages 1 to 17* were due to injuries, and 40% were from non-injuries.

Chart 4.



***Note: 2012 data are preliminary and may change**
α**Note:** There was no statistically significant difference in the percentage of deaths by cause categories for 2012 compared to previous years
Data Source: Kentucky Vital Statistics, Death Certificate Files 2012

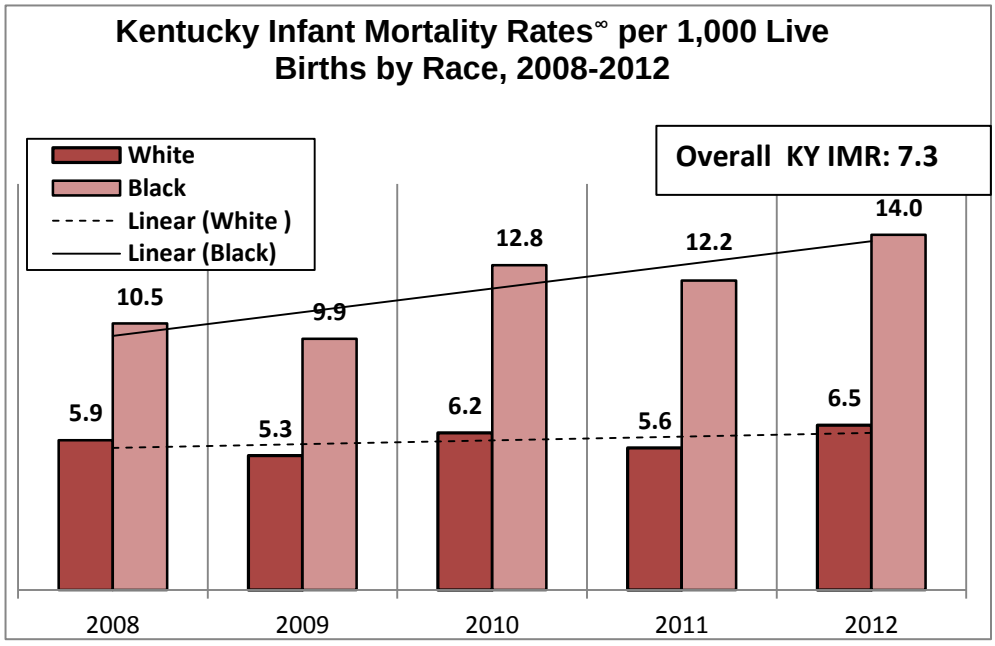
Racial Disparities in Child Fatalities

Across the US, there are disparities in the number of deaths among black children and white children. In Kentucky, this gap continues to grow, both for infants and for older children. Infant deaths in Kentucky are a major component of racial disparity among all childhood deaths.

Disparities in Infant Mortality. Nationally, black infants die at twice the rate as white infants in all major cause categories: preterm birth, birth defects, and SUID. One of the biggest discrepancies nationally was found in deaths associated to low birth weight, from which black infants die at nearly three times the rate as their white counterparts[20]. Nationally, in 2011 (the most recent national data available) the infant mortality rate for white infants was 5.2 per 1,000 live births, and the infant mortality rate for black infants was 10.6 per 1,000 live births[6]. MacDorman reports that the majority of the infant mortality disparity in the U.S. between black and white infants is due to causes related to prematurity and, to a lesser extent, SIDS, congenital malformations, and injury[20].

For infants in Kentucky, black infants continue to be more than twice as likely to die as white infants (Chart 5). In Kentucky, the 2012 infant mortality rate (per 1,000 live births) for white infants was 6.5, while the rate for black infants was 14.0. Review of the infant mortality rates show rates for white infants have remained fairly consistent over time yet have increased among black infants. Although this is preliminary data, the trend is concerning and merits further study.

Chart 5.



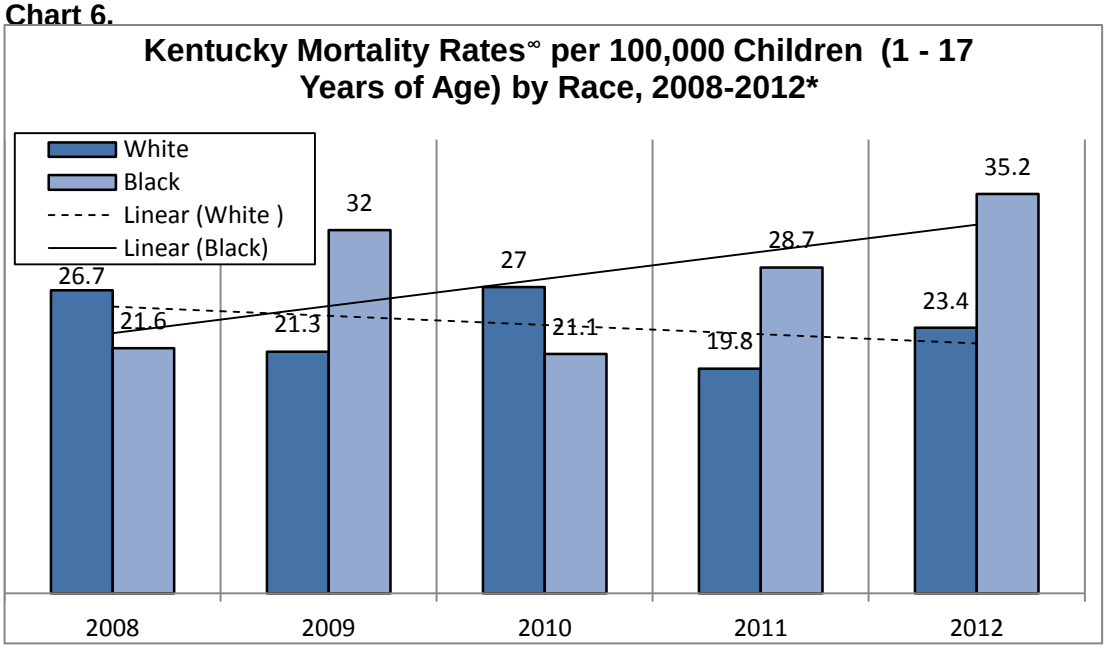
***Note: 2009-2012 data are preliminary and may change**

∞**Note:** Only Black and White Infant Mortality Rates are presented. All other races are excluded so rates presented do NOT equal Kentucky's overall Infant Mortality Rates.

Data Source: Kentucky Vital Statistics, Death Certificate and Birth Certificate Files 2008-2012; Additional deaths identified through KY Medicaid Claims Data Warehouse for Years 2010-2012 – Used to calculate the overall IMR for Kentucky.

Disparities in Child Deaths (age 1-17). From 2008-2012, Kentucky's mortality rate among black children indicates an increase over time, while the mortality rate among white children reveals a slightly decreasing trend (Chart 6). Although the gap in racial disparity is not as great among Kentucky children age 1 to 17 years as it is among Kentucky's infants, a gap is still present and appears to be widening. This disproportionate burden emphasizes the need for enhancing prevention efforts targeted towards Kentucky's black population.

Chart 6.



***Note: 2009-2012 data are preliminary and may change**

∞ **Note:** Only Black and White Childhood Mortality Rates are presented. All other races are excluded so rates presented do NOT equal Kentucky's overall Childhood Mortality Rates.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2008-2012; Kentucky State Data Center, Population Estimates by Race 2008-2012.

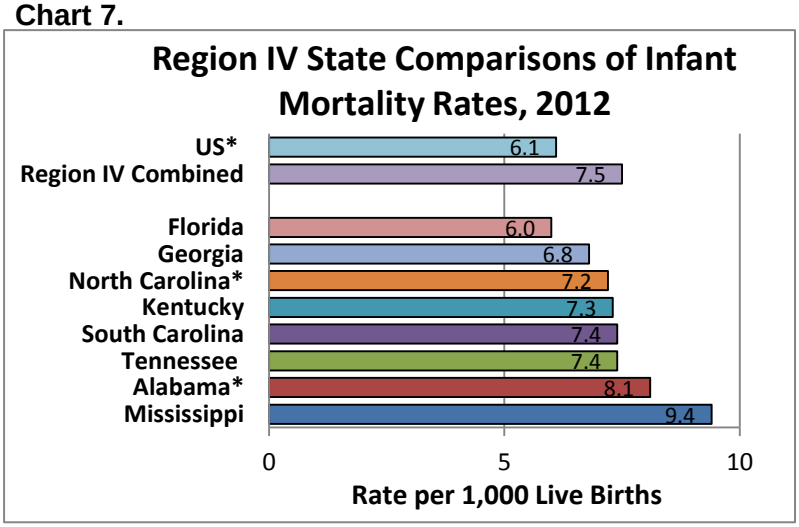
Of note, the five leading causes of death among white children (1-17 years) in Kentucky are motor vehicle collisions, suicide, cancer, diseases of the nervous system, and drowning. However, the five leading causes of death among black children are motor vehicle collisions, homicide, drowning, fire, and diseases of the nervous system. Deaths due to homicide occur among Kentucky's black children nearly five times the rate as homicide deaths occur among white children. This statistic is very troubling and highlights the need for increased efforts in violence prevention.

Region IV Child Fatality Rates Remain Above the National Average

Kentucky has joined other southern states in the U.S. Department of Health and Human Services, Health Resources Service Administration (HRSA) Regions IV and VI Collaborative Improvement and Innovation Network (CoIIN) with its efforts to reduce infant mortality. Within the eight southern states of Region IV, there are many similarities regarding racial disparity, limited access to health care, poverty, and families living in rural areas with little or no services available. Comparing rates of child fatalities with other states in Region IV helps to bring into focus these barriers and what could be the most effective prevention strategies for reducing infant and child fatalities.

Infant Mortality. Out of the eight southern states in Region IV, Kentucky ranks 4th worst in infant mortality rates for 2012[28]. Kentucky's infant mortality rate is 7.3 per 1,000 live births and is consistent with the combined rate of Region IV at 7.5 per 1,000 live births. Region IV remains higher than the total U.S. infant mortality rate, which was 6.1 per 1,000 live births as of 2011. The five common strategies of the CoIIN include: Reducing Early Elective Delivery, Reducing Smoking in Pregnancy, Interconception Care Models, Regionalized Perinatal Care, and Safe Sleep Strategies.

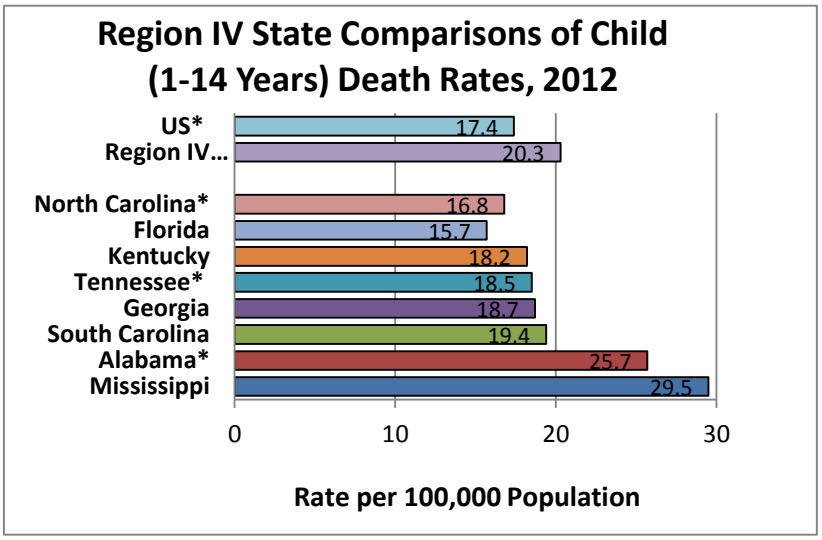
Chart 7.



Data Source: US Department of Health and Human Services, Health Resources and Services Administration, Title V Information System, National Performance and Outcome Measures., Most recent year available
*__Note__: Alabama, North Carolina, and the US rates are based on 2011 data, the most recent year available

Child Deaths. Kentucky was the third lowest (best) state in Region IV with a child injury death rate of 18.2 per 100,000 children ages 1-14. Data source utilized for regional comparisons are only reported for the age group 1-14 years. Kentucky is slightly lower than the combined child death rate for the region at 20.3 per 100,000 children in that age group. As with the infant mortality rate, Region IV's rate of child deaths is higher than the national average of 17.4 per 100,000 children (Chart 8).

Chart 8.



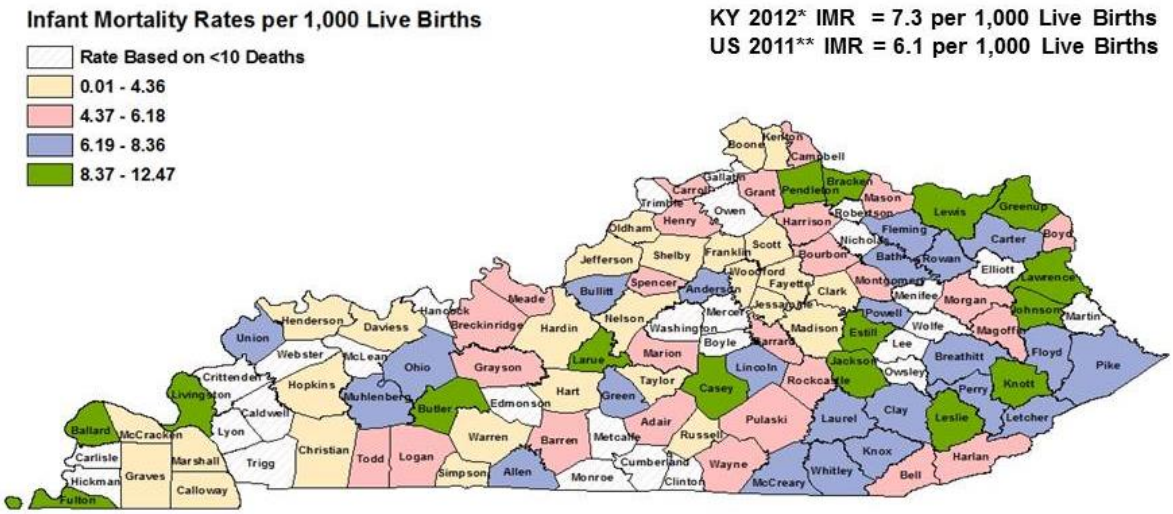
Data Source: US Department of Health and Human Services, Health Resources and Services Administration, Title V Information System, National Performance and Outcome Measures., Most recent year available
*__Note__: Alabama, North Carolina, and Tennessee are based on 2011 data, the most recent year available. The US rate is based on the most recent year available (2010, 2011, 2012) submitted by each state

State Geographic Variations

From 2002 to 2012, Kentucky infant and child mortality rates across the state show no specific pattern in any particular region (Map 2 and Map 3).

Map 2.

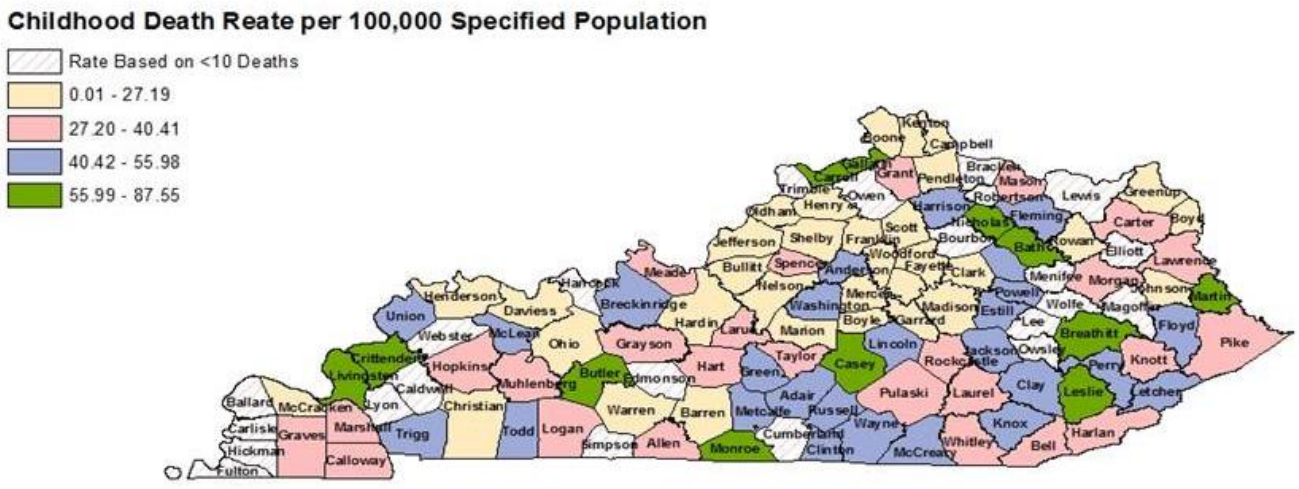
Kentucky Infant Mortality Rates (IMR) by County, 2002-2012*



*2009-2012 data are preliminary and numbers may change.
Data are preliminary and numbers may change – **Source: National Vital Statistics Reports, Volume 61, Number 6, October 10, 2012.
Data Source: 2002-2012 Kentucky Vital Statistics Files, Live Birth and Death Certificates; Additional deaths identified through KY Medicaid Claims Data Warehouse for Years 2010-2012 – Used to calculate the overall IMR for Kentucky.

Map 3.

Kentucky Childhood (1-17 years of age) Death Rate by County, 2002-2012*



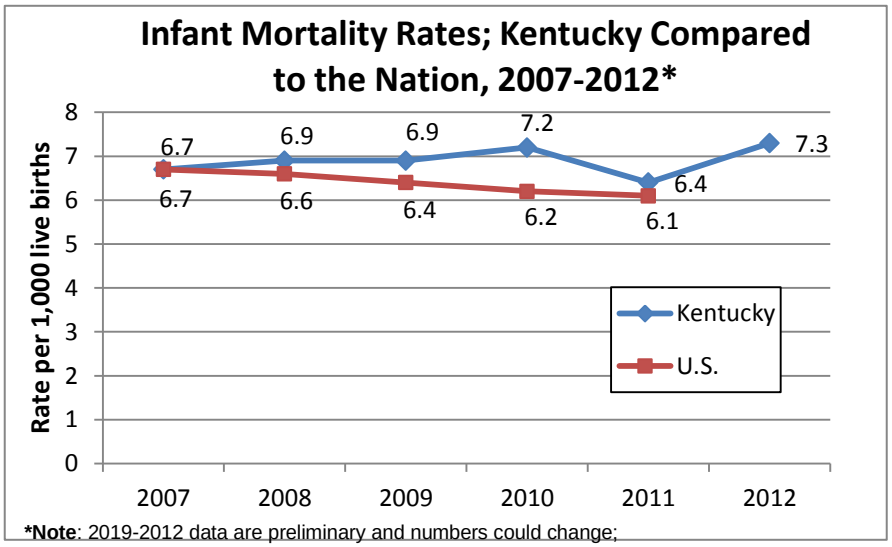
*2009-2012 data are preliminary and numbers may change.
Data Sources: 2002-2012 Kentucky Vital Statistics Files, Death Certificates; Denominator data: Kentucky State Data Center, Child Population Estimates by County 2002-2012.

Kentucky's Infant Mortality Remains High

The infant mortality rate is an estimate of the number of infant deaths for every 1,000 live births and is seen as the best indicator of a state's overall health, social, and economic environment. Kentucky's infant mortality rate has, for many years, been close to the national average. However, recently the infant mortality rate in Kentucky has been increasing and is currently at 7.3 per 1,000 births as of 2012. Chart 9 illustrates how the national rate shows a declining trend, while Kentucky rates remain above the national rate. Although the data is preliminary, this adverse trend is a concern.

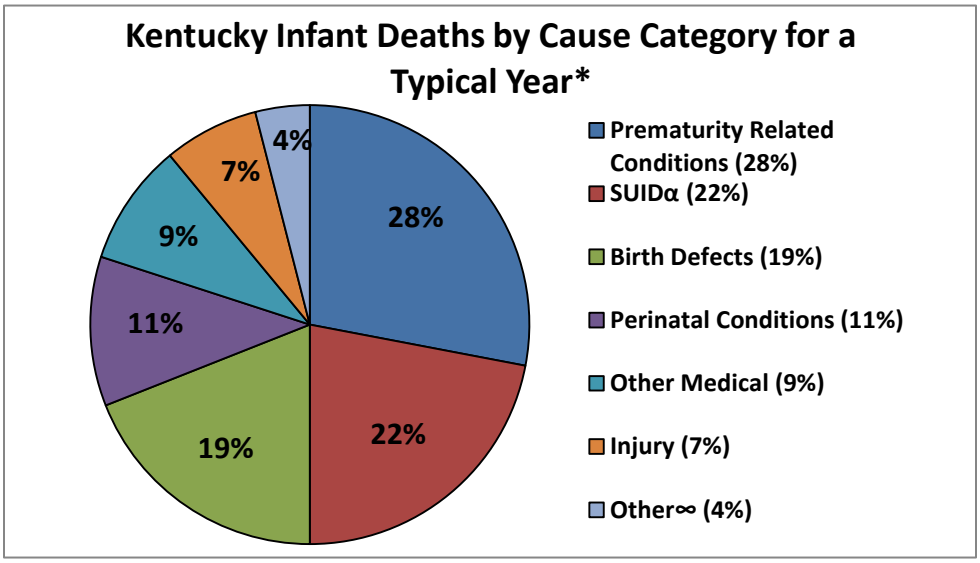
There are multiple factors influencing the state's infant mortality rate. Analysis of these deaths reveals that, unsafe sleep environments and smoking during pregnancy are common risk factors with opportunities for prevention. Nationally, Kentucky has one of the highest rates of smoking during pregnancy, which can cause miscarriage, premature birth, and/or low birth weight and is associated with an increased risk of birth defects[4]. Smoking, both during pregnancy and in the home after birth, increases the risk of Sudden Infant Death Syndrome (SIDS)[4].

Chart 9.



***Note**: 2019-2012 data are preliminary and numbers could change;
Data Source: KY Vital Statistics Files, Death Certificate files, Years 2007-2012; Additional deaths identified through KY Medicaid Claims Data Warehouse for Years 2010-2012; National Center for Health Statistics, Deaths final data 2011; A preliminary US rate for 2012 is currently not available

Chart 10.



The three leading causes of infant death in Kentucky (Chart 10) and nationally are prematurity-related conditions, birth defects and Sudden Unexpected Infant Death (SUID) as reported by the CDC[6]. Since infant deaths comprise over half of all childhood deaths, the three leading causes of death among infants are also the three leading causes of death among all children.

***Note: A typical year is determined by taking the average number of deaths for each age group by cause for 2005 through 2012 combined.**
α **Note:** SUID Category includes only deaths due to infants (<1 year of age where the cause of death was coded as SIDS (R95), Accidental Suffocation in Bed (W75), or Undetermined (R99).
∞ **Note:** Other includes causes of death that varied over the time period and did not have enough data to qualify for a leading cause category.
Data Source: Kentucky Vital Statistics, Death Certificate Files 2005-2012; Additional deaths identified through KY Medicaid Claims Data Warehouse for Years 2010-2012.

Sudden Unexpected Infant Deaths in Kentucky

The CDC has broadened the focus on infant deaths that occur while sleeping to include not only Sudden Infant Death Syndrome (SIDS), but also accidental suffocation in bed and "undetermined." These all fall under the designation of Sudden Unexpected Infant Death (SUID). At least some SUID deaths are potentially preventable by implementing safe sleep practices. The CDC defines SIDS as the sudden death of an infant less than one year of age that cannot be explained after a thorough investigation has been conducted, including: a complete autopsy, examination of the death scene, and review of the clinical history. According to the CDC, it may be difficult to separate SIDS from other types of sudden unexpected infant deaths (SUID) even when a thorough investigation is conducted, especially in differentiating accidental suffocation in bed from SIDS. In Kentucky, an infant death is ruled undetermined when there is no anatomic, toxicological, or metabolic cause of death, but there is other compelling investigative information or physical evidence that is concerning and suggests the death was not a natural death[12]. This information may include evidence of unsafe sleep practices.

Using the broader category of SUID, these infant deaths become the second leading cause of death among Kentucky's infants. The table below presents the types of SUID cases and leading sleep-related risk factors that have occurred over a 4-year span in Kentucky. Table 3 also presents the most common risk factors documented by coroners and medical examiners associated with SUID deaths. These infants may have more than one risk factor associated with the death.

Table 3.

Number of SUID[α] Deaths by Type and Presence of Risk Factors, 2009-2012*				
	2009	**2010**	**2011**	**2012**
Type of SUID[α] Death				
SIDS	61	63	49	45
Undetermined	10	22	12	10
Asphyxia[ǂ]	22	21	12	16
Total Number of SUID[α] Deaths	**93**	**106**	**73**	**71**
Sleep-Related Risk Factors Present[∞]				
Sharing sleep surface at time of death	55	62	41	34
Surface not designed for infant sleep	64	73	49	41
Hazards in Sleep Area	20	20	30	32
Sleep Position (Prone or On-Side)	19	25	25	24

***Note: 2009-2012 data are preliminary and may change**

[α] **Note:** SUID Category includes only deaths due to infants (<1 year of age) where the cause of death was coded as SIDS (R95), Accidental Suffocation in Bed (W75), Undetermined (R99), Other specified threats to breathing (W83), and Unspecified threat to breathing (W84).

[ǂ] **Note:** Asphyxia includes deaths where the cause of death was coded as Accidental Suffocation in Bed (W75), Other specified threats to breathing (W83), and Unspecified threat to breathing (W84).

[∞] **Note:** Categories under the Sleep-Related Risk Factors are not mutually exclusive

Data Source: Kentucky Vital Statistics, Death Certificate File 2009-2012; Coroner's Reports; Child Fatality Review Team Reports; and Kentucky Medical Examiner's Reports, 2009-2012.

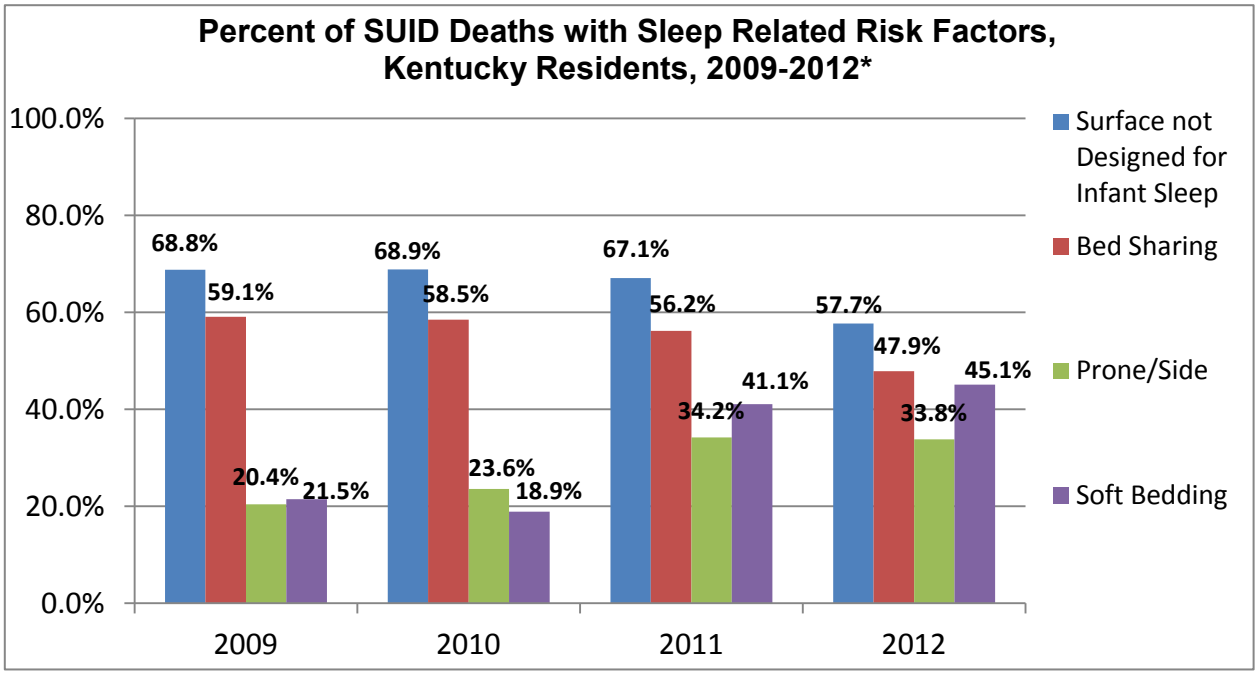
Sleep-related Risk Factors Present in Majority of SUID Deaths

Using all three types of SUID deaths (SIDS, undetermined, and asphyxia), Kentucky's data from 2009 through 2012 shows 82.2% of the deaths had documentation of at least one sleep-related risk factor. However, there are generally two or more sleep-related risk factors present for every death due to SUID. Common risk factors found in sleep related deaths are: child sleeping on a surface not designed for infant sleep (adult bed, sofa, recliner, etc.); sharing a sleep surface (bed, sofa) with an adult or older child; soft bedding and hazards (pillows, blankets, stuffed animals) in the sleep area; child not sleeping on back (placed on stomach or side position); and smoking in the home. A smoke-free environment is vitally important. In a national study, smoking in pregnancy accounted for 23%-34% of deaths due to SIDS[13], so the high rates of smoking in Kentucky place our infants at increased risk.

Many sleep related deaths among Kentucky infants might have been prevented if the infant was placed in a safe sleep environment. For 2012, more than half (57.7%) of the SUID deaths documented that the infant was placed on a surface not designed for infant sleep, and 45.1% of the documentation revealed that the infant was found with soft bedding. SUID deaths in Kentucky attributed to the risk factor of bed sharing or same surface sleeping (infant sleeping with an adult or older child) show a decrease from previous years at 47.9% for 2012. Consequently, prevention efforts focusing on the risk factors associated with sleep related deaths are occurring across the state.

Chart 11 illustrates the percentage of SUID infant deaths in Kentucky with sleep-related factors for the years 2009 through 2012. Documentation on SUID deaths reveals the practice of placing infants in their stomach or side position to sleep, which is contrary to national recommendations, has increased as a contributing factor over the last four years. Infant deaths classified as an SUID death found on a surface not designed for infant sleep have been decreasing in the past few years. However, the percentages of SUID deaths with the risk factor of soft bedding have increased since 2009. Educating parents and caretakers about safe sleep as well as modeling safe sleep in hospital settings is a key component in reducing SUID deaths.

Chart 11.



***Note: 2009-2012 data are preliminary and may change**
SUID cases are those with the primary cause of death listed as ICD-9 Codes R95 (SIDS), R99 (Undetermined), W75 (Accidental Suffocation and Strangulation in Bed), W83 (Other Specified Threats to Breathing) and W84 (Unspecified Threat to Breathing).
Source: Kentucky Death Certificate Files, 2009-2012, Office of Vital Statistics, and Kentucky Medical Examiner's Reports, 2009-2012

SUID Prevention Efforts

What does Safe Sleep Look Like?

The "Back to Sleep" campaign, which began in 1992, has been successful. The SIDS rate has decreased by more than 50% since the introduction of the "Back to Sleep" campaign[27]. As a result of new scientific research, the American Academy of Pediatrics (AAP) guidelines were revised and broadened in 2011 to become the "Safe to Sleep" program[3].

The AAP currently recommends[3]:

- Infants should always be placed on their backs; in their own bed; on a firm sleep surface; without pillows, comforters, or other soft surfaces. [**A**=alone, **B**=on their Back; **C**=in their own crib (includes bassinette or play yard)]
- Keep the infant's crib, bassinet or play yard free of soft objects, toys and loose bedding. Bumper pads, quilts, blankets, and pillows are potential hazards for the infant.
- Smoking is a common risk factor found in deaths occurring during sleep. There should be no smoking during or after pregnancy and there should be no smoking around the infant.
- Room sharing with the infant is appropriate but do not share the bed. Infants should be in a crib, bassinet, or play yard.
- Breastfeeding has many benefits to both the mother and infant and can reduce the risk of SIDS.
- Consider giving the infant a clean, dry pacifier when placing the infant down to sleep. There is no need to replace during sleep if the pacifier falls out.
- Do not let the infant overheat.
- Avoid products that claim to reduce the chance of SIDS as most have not been tested for safety. Home monitors do *not* reduce the risk of SIDS and should not be used for that purpose.

The new Safe to Sleep materials endorsed by the AAP and other national experts are available cost free from the National Institute of Child Health and Human Development (NICHHD) at http://www.nichd.nih.gov/sts/Pages/default.aspx.

In Kentucky prevention efforts include educating families, caregivers, and childcare providers on the AAP recommendations; having hospitals and child care agencies model safe sleep practices; and promoting the "Safe to Sleep" program to anyone caring for an infant, even if they only have the infant for short periods.

Examples of specific prevention initiatives for safe sleep are documented in the Community Actions section of this report.

INJURIES ACCOUNT FOR MOST DEATHS IN CHILDREN AGES 1-17

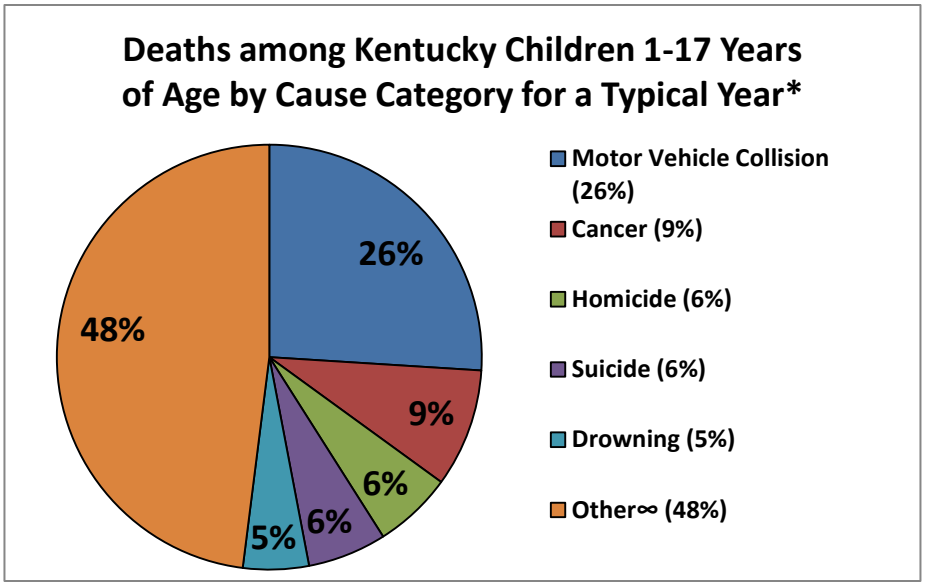
The CDC reports that injury is the number one killer of children and teens. Although nationally child injury death rates have decreased 29% in the last decade, it is also the most under-recognized public health problem facing our country today[7].

In Kentucky for 2012, **injury deaths** accounted for 58% of all deaths for ages 1-17 years. Injuries can be unintentional (accidental) or intentional (non-accidental). The category of unintentional injury includes motor vehicle collisions, suffocation, drowning, fire, and poisoning. Unintentional injury can also occur from falls, exposures to chemicals, or forces of nature among other things. According to the CDC, unintentional injury is the leading cause of death from age 1 until age 44. The category of intentional injury includes deaths from homicide, including child abuse and suicide.

The most common injury death among children ages 1-17 is motor vehicle collisions. In Kentucky, these deaths account for approximately 26% of all deaths occurring among this age group (Chart 12). There are smaller proportions of deaths due to homicide, suicide, and drowning. Injury deaths may be preventable, whereas non-injury deaths are less likely to be preventable.

Non-Injury deaths accounted for 40% of deaths in Kentucky children ages 1-17 years in 2012. In a typical year, non-injury deaths include cancer (9%) and other medical conditions such as infectious diseases as well as and digestive and respiratory disorders.

Chart 12.



***Note: A typical year is determined by taking the average number of deaths for each age group by cause for 2005 through 2012 combined.**

∞ **Note:** Other includes deaths due to birth defects, infectious disease, disease of the blood, disease of the circulatory system, disease of the digestive system, disease of the respiratory system, disease of the genitourinary system, disease of the musculoskeletal system, metabolic disorders, complications of medical and surgical care, mental and behavioral disorders, exposure to forces of nature, exposure to inanimate and animate mechanical forces, exposure to electric current, exposure to unspecified forces, pedestrian or bicyclist injured, animal transport accident, water transport accident, falls, poisoning, suffocation, syncope and collapse, undetermined causes.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2005-2012: Additional deaths identified through KY Medicaid Claims Data Warehouse for Years 2010-2012.

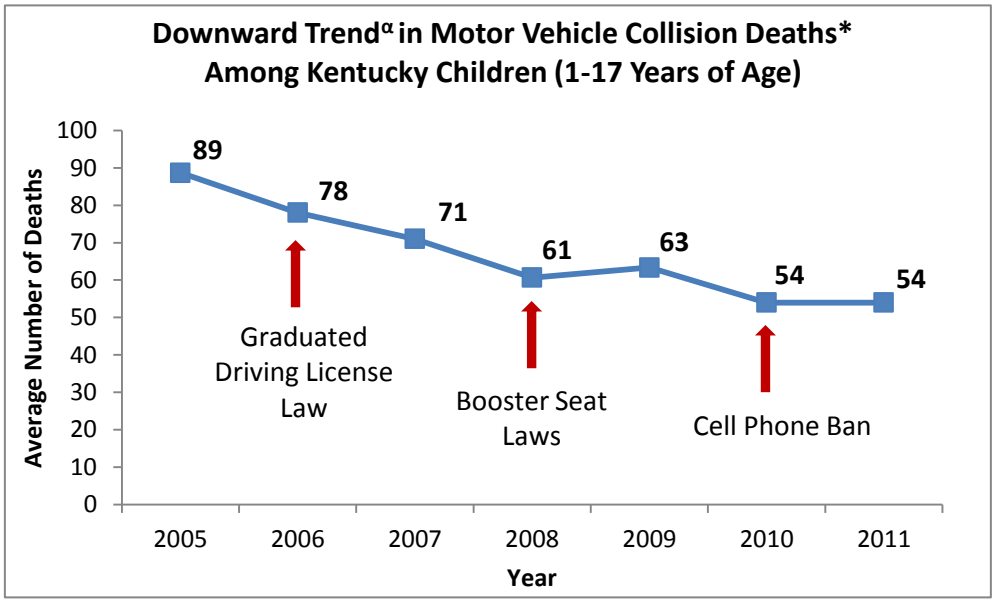
The "other" category presented in Chart 12 includes causes of death that vary over time and do not occur with high frequency (<5% of deaths each). Some causes of death that are grouped into the "other" category include: infectious disease, heart disease, other medical conditions, poisoning, fire, and other external causes. Although poisoning and fire deaths are not leading causes of death among Kentucky's children 1 to 17 years of age, they are reported here because they are important from a prevention standpoint.

Motor Vehicle Collisions are the Leading Cause of Death in Children Ages 1-17

Motor Vehicle Collision (MVC) deaths include fatal injuries from being the driver or passenger of a motor vehicle involved in a crash, or from being struck by, or falling off of, a moving vehicle. The National Highway Traffic Safety Administration (NHTSA) reported that from 2003 to 2012, the number of fatalities nationally in the under-14 year age group decreased by 45%[25].

Motor vehicle collisions remain the leading cause of injury-related death in Kentucky for children aged 1-17 years. However, in Kentucky, child deaths related to motor vehicle collisions have seen a steady decline since 2004, as depicted on Chart 13. Initiatives such as the graduated driving license law, booster seat law, and the cell phone ban for teen drivers are shown plotted on Chart 13. These initiatives have been recognized as major factors influencing this decrease.

Chart 13.



***Note: 2009-2012 data are preliminary and may change**

α**Note:** A three-year rolling average has been plotted to present the trend in Kentucky's Motor Vehicle deaths from 2004-2012. Therefore, the data point at 2005 is really a yearly average of 2004, 2005, and 2006, the data point for 2006 is the yearly average of 2005, 2006, and 2007, and 2007 is 2006, 2007, and 2008 and so on and so forth.

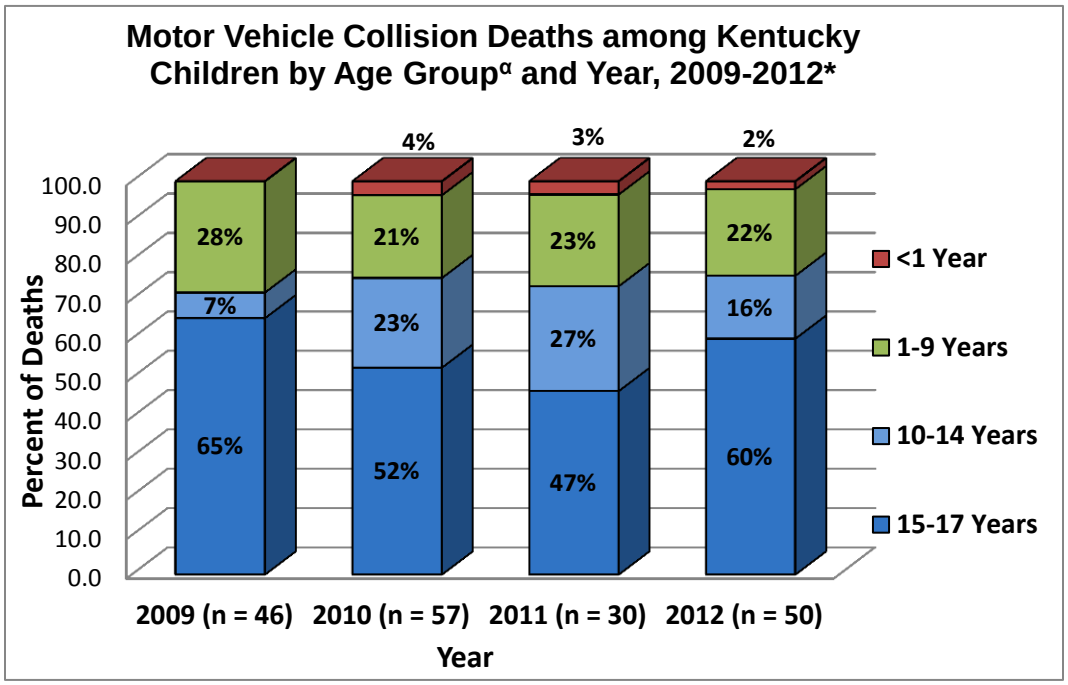
Data Source: Kentucky Vital Statistics, Death Certificate Files 2005-2012.

Child Deaths from MVC

In Kentucky during 2012, children aged 1 to 9 years (car and booster seat ages) comprised 22% of the motor vehicle deaths. Although KRS 189.125 currently requires booster seats for children younger than seven and less than 50" tall, the national recommendation for booster seat use is that the child continues to be in the booster seat until a child's height reaches 4'9" (57") or child reaches the age of nine[23]. At that time, the decision should be made on an individual basis whether the seat belt is fitting correctly without a booster seat, since almost no child has achieved adult height by age nine.

Correctly used child safety seats can reduce the risk of death by as much as 71%[35]. In Kentucky, the 2012 data shows that Children aged 10 to14 years (Chart 14) accounted for 16% of the total child motor vehicle collision deaths. Children within this age range should be appropriately buckled and should continue to ride in the back until at least age 12.

Chart 14.



***Note: 2009-2012 data are preliminary and may change**

α**Note:** There was no statistically significant difference in the percentage of deaths for each age group for 2012 compared to previous years

Data Source: Kentucky Vital Statistics, Death Certificate Files 2009-2012

Teen Driver Deaths Represent almost half of all MVC Deaths

Nationwide, in 2012, young drivers who died due to MVCs decreased 6% from 2011[26]. Common patterns are seen with the fatal collisions in this age group. The National Highway Transportation and Safety Administration (NHTSA) reports that 20% of teen drivers who died in a motor vehicle collision were driving with an invalid driver's license at the time of the crash[23]. NHTSA reports that national fatal teen MVCs occur most frequently between 3 and 8 p.m. but remain high until midnight[23]. A NHTSA study reported that teenage drivers were 2.5 times more likely to engage in risky behaviors while driving with one passenger and three times more likely to participate in these activities with multiple passengers[16]. NHTSA data shows that:

- half of the teen drivers who died were not restrained;
- 35% of teen drivers were speeding at the time of the fatal crash;
- 27% percent of teen fatalities had positive blood alcohol concentrations; and
- 12% of teen drivers were distracted (e.g., passengers, cell phone use) at the time of the crash[23].

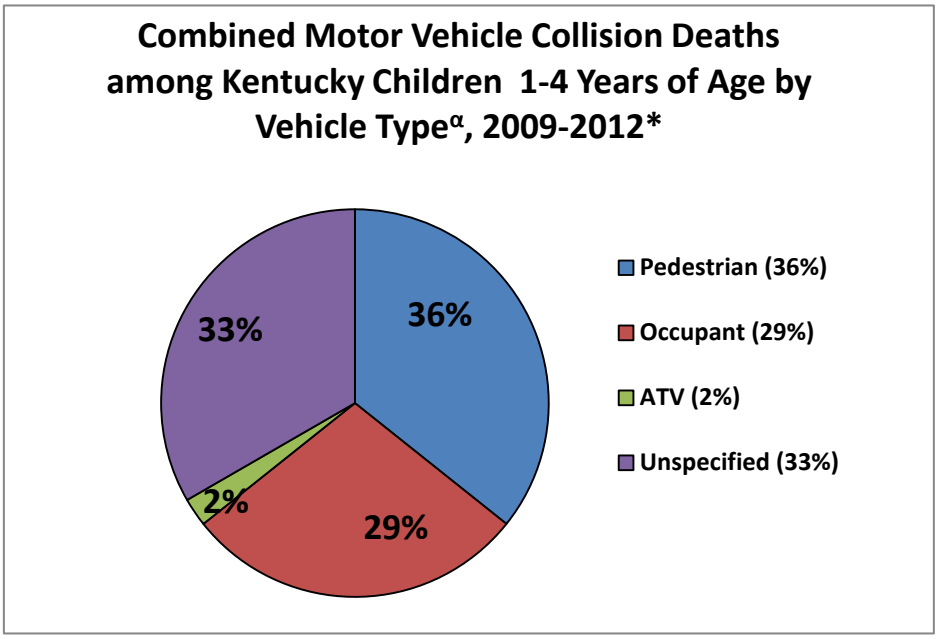
For the year 2012 in Kentucky, more than half of the child deaths due to motor vehicle collisions occurred among teenagers 15-17 years of age. Current efforts in Kentucky to reduce the number of deaths of young drivers include: the graduated driving license initiative, a cell phone ban for drivers under 18, and driver safety programs, which address risk factors for youth drivers.

Since 2011, the National Highway Traffic Safety Administration and the American Academy of Pediatrics[2] have made the following recommendations for child passenger safety:

- Infants and toddlers should ride in a rear-facing car seat until age two or until they reach the top height or weight limit allowed by the car seat manufacturer.
- Once a child outgrows the rear-facing car seat, he/she is ready to travel in a forward facing car seat with a harness.
- When a child is too tall for that seat or too heavy for the harness weight specified by the manufacturer, he/she should graduate to a belt-positioning booster seat.
- For safest travel, a child should remain in a booster seat until he or she is big enough (usually between the ages of 8-12 years) to fit in an adult seat belt properly with the lap belt lying snugly across the thighs and shoulder belt snug across the collarbone.
- For greatest safety, parents are also advised to avoid advancing to the next phase prematurely, and to wait until the size of the child dictates the need to transition into the next phase.
- Keep a child in the back seat at least through age 12.

Pedestrian Deaths: Not all motor vehicle collision deaths are related to the child being a passenger. Between the years 2009-2012 in Kentucky, 36% of children ages 1-4 years who died in motor vehicle related incidents died as a pedestrian, not as an occupant. Parents and caregivers must be extremely vigilant over young children in traffic areas.

Chart 15.



***Note: 2009-2012 data are preliminary and may change**

α **Note:** There was no statistically significant difference in the percentage of deaths for each vehicle type for 2012 compared to previous years

Note: Unspecified Category includes: motor vehicle collision deaths in which the mode of transportation is unspecified.

Data Source: Kentucky Vital Statistics, Death Certificate Files 2009-2012

Child Maltreatment is the most common cause of Homicide deaths in Children under age 5

Younger children and infants who die as result of child maltreatment are homicide deaths. However, child maltreatment is typically not entered as the cause of death on the death certificate. Rather, these deaths are often submitted as "undetermined" or "assault by unspecified means" for the official cause on the death certificate because investigations may take months or years to complete. Making a determination of child maltreatment with a fatality involves a collaborative effort from the Coroner's office, law enforcement, and the Department of Community Based Services (DCBS).

In Kentucky, child maltreatment deaths remain a major concern due to the violent nature of these deaths and the potential for prevention. Child maltreatment includes those who die from neglect and physical abuse. According to the 2012 Child Fatality and Near Fatality Annual Report from DCBS, there were a total of 24 fatalities where child maltreatment was substantiated and found to be the cause of death in calendar year 2012. Of these, DCBS reported that 15 deaths occurred among males and nine among females. Infants under the age of 1 accounted for 38% of the deaths in 2012. More than half (54%), were children who were ages 1 to 4 and 8% of the substantiated maltreatment deaths occurred between the ages of 5 and 17 years. DCBS and national statistics indicate that domestic violence, substance abuse, and/or mental health risk factors are present in many child maltreatment cases[17]. DCBS reported in state fiscal year 2014 domestic violence was present in 68.8% of child maltreatment fatalities and near fatalities, and was found in 64.1% of all substantiated child maltreatment cases. Substance abuse was a documented risk factor in 69.7% of fatalities, and 51.9% of cases where child abuse or neglect was substantiated[17].

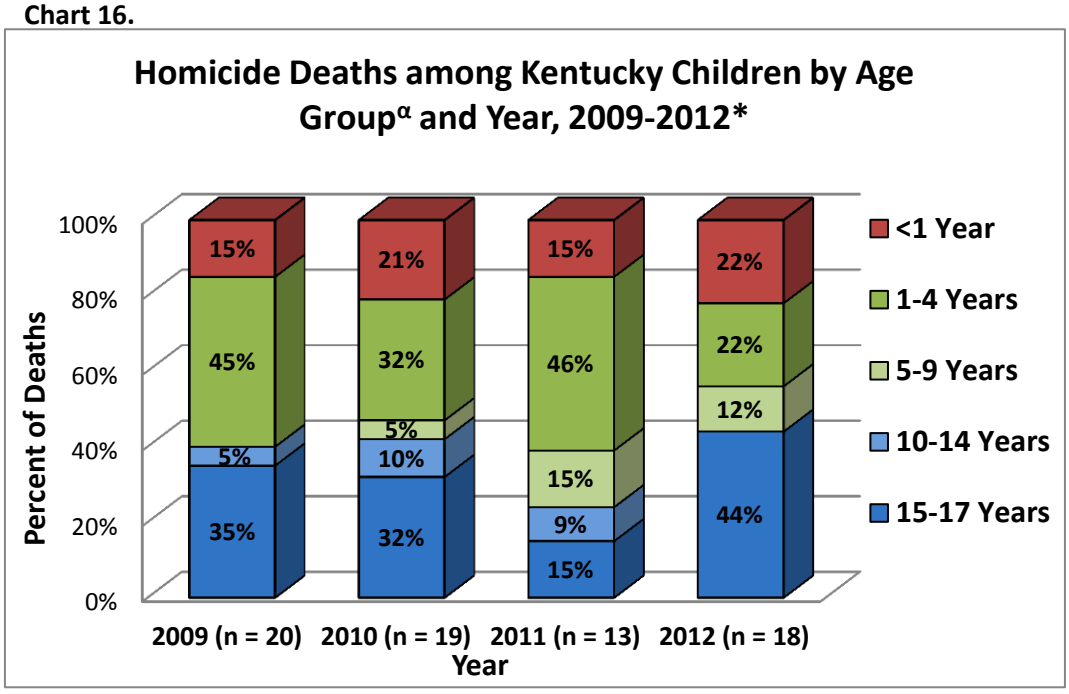
In 2012, an estimated 1,640 children died of abuse and neglect in the United States[37]. National statistics show that children under six years of age account for 86% of all maltreatment deaths and infants account for 43% of these deaths[28]. The U.S Department for Health and Human Services reports that the youngest children are the most vulnerable due to dependency and small size[37]. In 2012, similar to past years, mothers were more likely to be the perpetrator of deaths by neglect while a male caretaker, (father or other male) were likely to be the perpetrators of deaths by physical abuse[37].

Preventing child maltreatment and subsequent fatalities is a public health concern. The CDC recommends that communities approach child abuse prevention by seeking to create safe, stable, and nurturing relationships and environments. These are considered *Essentials for Childhood*, conditions necessary to assure children reach their full potential. Resources can be found on the CDC web site[10]. In this approach, communities develop strategies to promote the types of relationships and environments that help children grow up to be healthy and productive citizens so that they, in turn, can build stronger and safer families and communities for their children[10]. CDC reports that a child experiencing child maltreatment is more susceptible to both short and long-term health problems[11]. Child maltreatment is a form of toxic stress which results from Adverse Childhood Experiences that may be sustained for a long period of time. This type of stress can disrupt early brain development, compromise the functioning of important biological systems, and lead to long-term health problems[22]. Zimmerman and Mercy reported that there is compelling scientific research base that makes the case for preventing maltreatment as a strategy to promote health and prevent adult disease[40]. Assuring safe, stable, and nurturing relationships and environments for children outside the home is equally important, and a role of the entire community [10]. In Kentucky, programs such as Health Access Nurturing Development Services (HANDS), Special Supplemental Nutrition Program for Women, Infants and Children (WIC Program), and prenatal services are already providing primary prevention by assisting families in providing supports for the physical, social, and emotional well-being of children.

Homicide data from Vital Statistics files

The numbers in the previous section for child maltreatment deaths reported by the Department of Community Based Services are not necessarily reflected in the numbers of homicides obtained from Vital Statistics. As previously stated, many of the child maltreatment deaths are listed as undetermined on the death certificates and homicide would not be marked due to an on-going investigation. Some of these deaths could have pending law enforcement investigations and/or ongoing investigations from DCBS. There is some overlap in the numbers, as child maltreatment deaths, like Abusive Head Trauma, will be coded on the death certificates and recognized as child maltreatment in the information from the death certificates. Child maltreatment deaths that have fractures or a constellation of symptoms may only have those symptoms listed on the certificate and may not be listed here as a child maltreatment death.

Chart 16.



***Note: 2009-2012 data are preliminary and may change**

[α] **Note:** There was no statistically significant difference in the percentage of deaths for each age group for 2012 compared to previous years**.**

Data Source: Kentucky Vital Statistics, Death Certificate Files 2009-2012

Homicide Deaths in Young Children

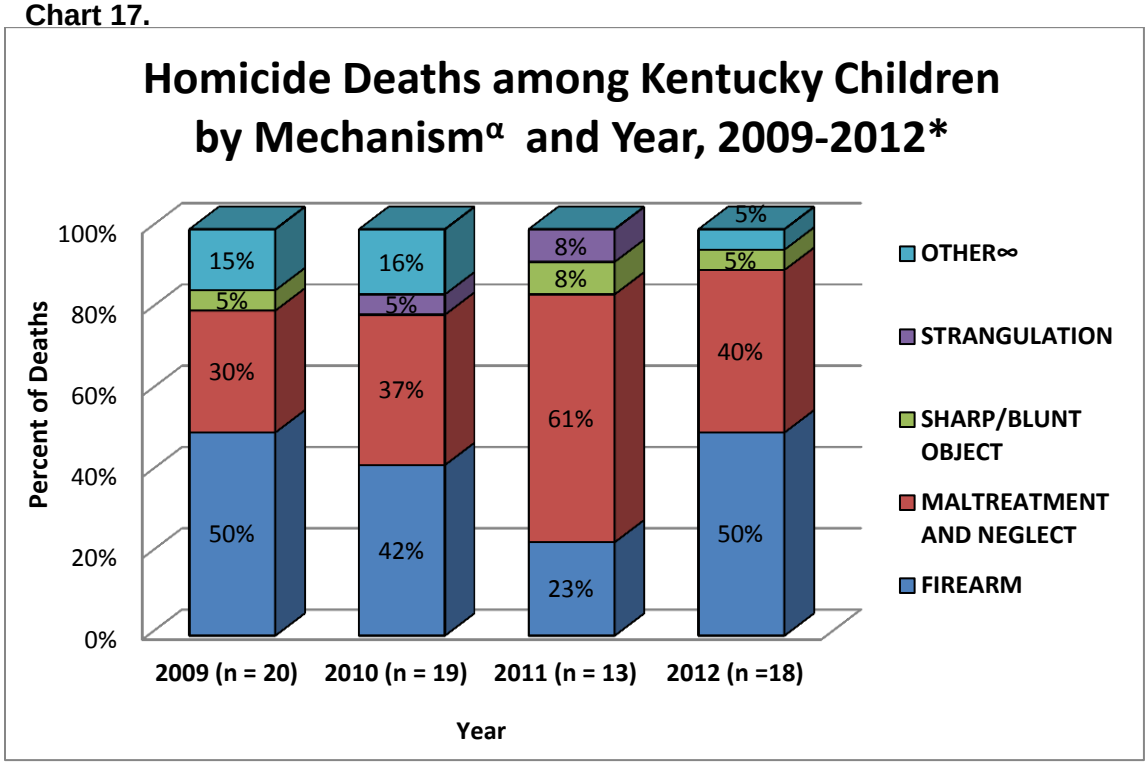
For children less than age 5, child maltreatment accounts for the majority of homicide among this age group. In children over age 5, and especially after age 9, child maltreatment is much less common. Kentucky's data reflects these national trends.

The National Office of Juvenile Justice and Delinquency Prevention (OJJDP) reports that a substantially larger proportion of victims under age 6 were killed by family members than victims ages 15–17 (57% vs. 3%). Another major difference between the murder of older and younger juveniles was the relative involvement of firearms[29]. In 2011 nationally, firearms were used in 17% of murders of juveniles under age 12 and in 81% of the murders of juveniles ages 12–17[29]. The CDC recommends the need for continual use of evidence-based, primary prevention strategies to stop youth violence. Utilizing the public health sector to reach the highest-risk youths with effective evidence-based prevention strategies is particularly critical to reduce the number of juvenile homicides both nationally and statewide [5].

Mechanism Used in Child Homicides

Chart 17 illustrates the mechanism used in homicides of children in Kentucky. For 2012, 50% of the homicide deaths among children were the result of a firearm, while child maltreatment accounted for 40% of the deaths in 2012. Firearm deaths are potentially preventable by locking up guns and ammunition, and by promoting gun safety to families.

Chart 17.



***Note: 2009-2012 data are preliminary and may change**

α **Note:** There was no statistically significant difference in the percentage of deaths for each mechanism category for 2012 compared to previous years**.**

∞ **Note:** Other category includes homicides in which the mechanism was unspecified, poisonings, and vehicular

Data Source: Kentucky Vital Statistics, Death Certificate Files 2009-2012

Suicide is the Second Leading Cause of Death in Kentucky Teens

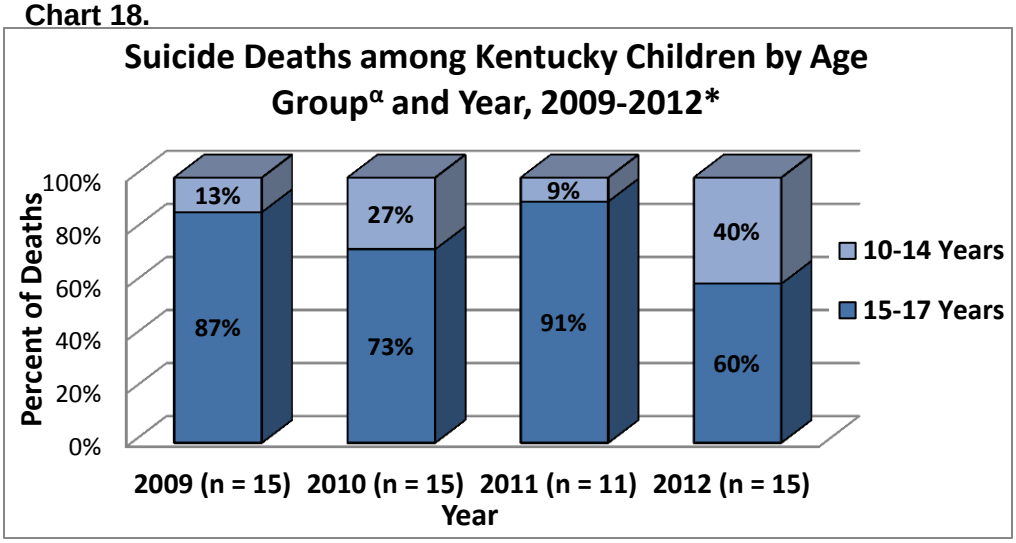
Nationally, the CDC reports youth suicide is the third leading cause of death for youth[8]. The top three methods used nationally in suicides of young people remain firearms (45%), suffocation/strangulation (40%), and poisoning (8%)[8].

As in the nation, the majority of child suicides in Kentucky occur in teenagers. Four out of five of the suicide deaths were in males. The most common method was with firearms, while strangulation was the second most common method. Some of the known risk factors include history of previous attempts of suicide, family history of suicide, depression and/or other mental illness, substance abuse, stressful life event, easy access to lethal methods, and incarceration[8]. The Substance Abuse and Mental Health Services Administration (SAMHSA) also reported that both victims and perpetrators of bullying are at higher risk of suicide than their peers[36]. Children in the Juvenile Justice system and those in foster care are at increased risk[31, 32].

Many programs and initiatives are underway in Kentucky to address youth suicide. Efforts focus on utilizing the strategic prevention framework and collaborative systems of care approaches to assess needs and build capacity to meet the needs of at-risk youth at whichever point they enter the system. These points of entry for services could be through the schools, mental health providers, health care providers, or other community agencies. Communities should support schools screening for mental health issues in children.

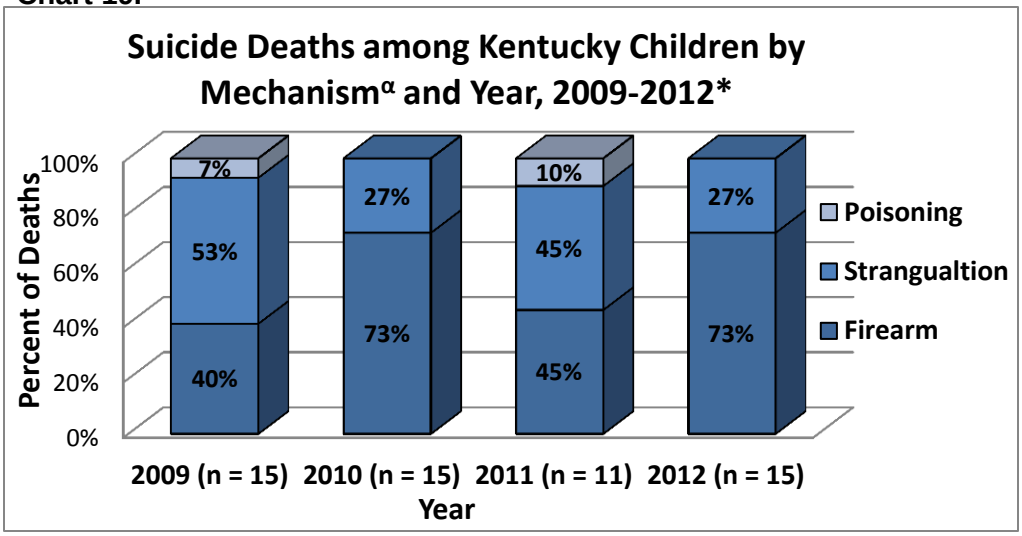
In response to over 15,000 reported incidents of bullying in Kentucky during the 2012-2013 school year, Governor Steve Beshear announced the creation of the Kentucky Youth Bullying Prevention Task Force. The task force consists of 22 members, including students, who will study bullying in schools and recommend practices and policies to help provide safer and harassment-free schools.

Chart 18.



***Note: 2009-2012 data are preliminary and may change**
α**Note:** There was no statistically significant difference in the percentage of deaths for each age group for 2012 compared to previous years**.**
Data Source: Kentucky Vital Statistics, Death Certificate Files 2009-2012

Chart 19.



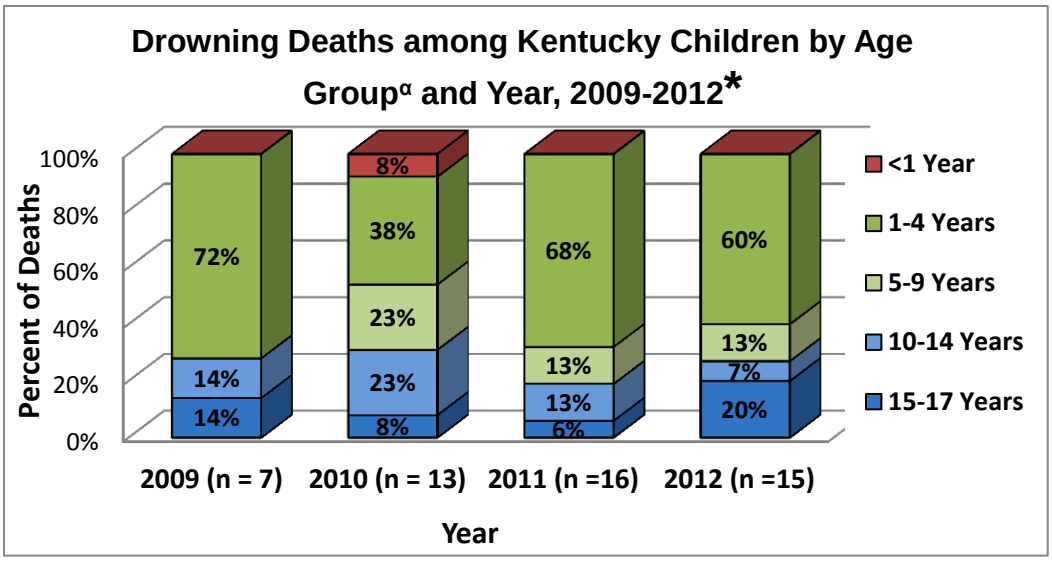
***Note: 2009-2012 data are preliminary and may change**
α**Note:** There was no statistically significant difference in the percentage of deaths by mechanism for 2012 compared to previous years
Data Source: Kentucky Vital Statistics, Death Certificate Files 2009-2012

Drowning Deaths are Highest Among Children Aged 1-4 Years

In 2012 there were 15 Kentucky children who died from drowning, though drowning deaths have shown no significant increases in the past few years. Children between the ages of 1-4 accounted for over half (60%) of the drownings that occurred in 2012 in Kentucky (Chart 20). Drowning deaths for all ages are potentially preventable.

In 2012, the largest proportion (40%) of the drowning deaths took place in a pool in Kentucky. Of note, the deaths related to pools occurred at the child's residence or at some other residence and not in public pools. Nationally, children aged 1-4 years were more likely to drown in a swimming pool than any other water source[39]. The most common factors contributing to drowning deaths are lack of supervision, lack of physical safety barriers, and inability of a child to swim[33].

Chart 20.

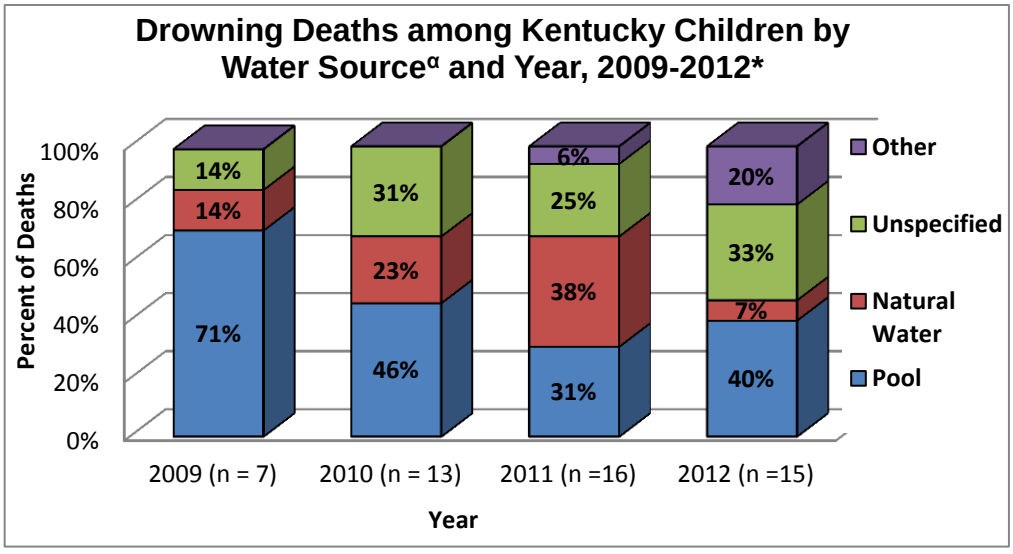


***Note: 2009-2012 data are preliminary and may change**

α**Note:** There was no statistically significant difference in the percentage of deaths by age group for 2012 compared to previous years

Data Source: Kentucky Vital Statistics, Death Certificate Files 2009-2012

Chart 21.



***Note: 2009-2012 data are preliminary and may change**

α**Note:** There was no statistically significant difference in the percentage of deaths by water source for 2012 compared to previous years

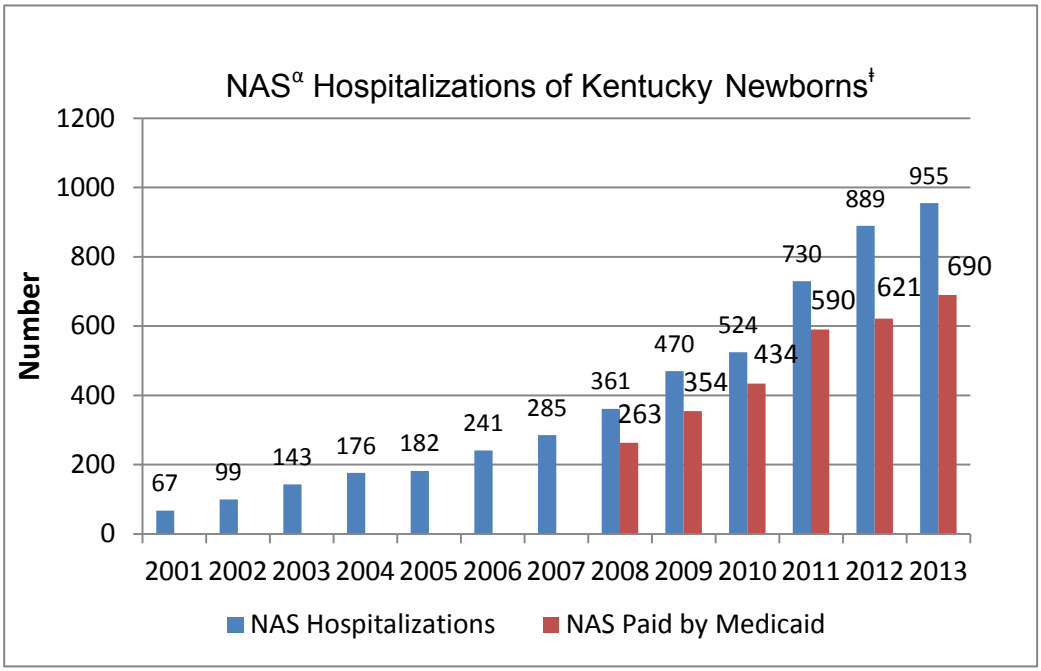
Data Source: Kentucky Vital Statistics, Death Certificate Files 2009-2012

As expected, the majority of drowning deaths in Kentucky occur during the summer months (May, June, July, and August). Prevention initiatives should start before this peak season for swimming, boating, and other water related activities. In 2014, the Kentucky American Academy of Pediatrics, in a collaborative effort with the State Child Fatality Review team, sent an alert to pediatricians prior to the peak season, which included nationally recommended patient education materials on drowning prevention to share with parents and caregivers.

Neonatal Abstinence Syndrome

When pregnant women take addictive drugs during pregnancy, the baby may become physically dependent on it, and the majority of these infants will go through withdrawal after birth. This is called Neonatal Abstinence Syndrome (NAS). The symptoms may include high pitched crying, decreased sleep, tremors, convulsions, irritability, nasal stuffiness and flaring, seizures, poor feeding, vomiting and diarrhea[30]. Symptoms of infant withdrawal due to drugs taken by the mother and passed to the baby may not start until 48-96 hours after delivery. These babies are transferred to Neonatal Intensive Care Units for treatment, but if the withdrawal is later, some may go home and go through withdrawal at home.

Chart 22.



In Kentucky, data from hospital discharge records indicate the number of NAS hospitalizations were 955 for 2013 compared to 241 in 2006 and 67 in 2001[19].
In Kentucky and nationally, 80% of NAS infants are covered by Medicaid. In the last five years, the rate of NAS among infants covered by Kentucky Medicaid has nearly doubled, with 690 NAS hospitalizations paid for by Medicaid in 2013.

*__Note__: **2009-2013 data is preliminary and numbers may change**
[ǂ]__Note__: Counts represent number of discharges, not necessarily the number of newborns. A newborn with an NAS diagnosis may be transferred to another inpatient facility and receive an NAS diagnosis at that facility also. In such cases there would be multiple NAS discharges for the same newborn.
[α]__Note__: NAS is defined by the ICD9-CM code 779.55
Data Source: Kentucky Medicaid Management Information System; Claims database for calendar years 2008-2013; Kentucky Injury Prevention and Research Center, KY Hospitalization Database for calendar years 2008-2013; Kentucky Vital Statistics, Live Birth Certificate files, 2001-2013

Infants who have experienced withdrawal may still have irritability and feeding problems after going home. Families must be prepared to deal with this and must have training including abusive head trauma prevention, ways to calm an infant, and an appropriate safe sleep environment before leaving the hospital. It is also important that the mother/caregiver get into treatment and have a plan should relapse occur. These infants are showing up the state's death files, with causes of Abusive Head Trauma or from placement in bed with a parent who is impaired from drugs, alcohol, or medications. Providers must be aware of these increased risks and be certain the transition from the hospital to community supports assure that these infants get to their medical home, and the family accesses follow-up from community services as planned. Emergency departments must be alert to the possibility that any infant presenting with irritability has a high risk to be in a potentially dangerous situation, and they should look up the prescription drug use history of the mother in the Kentucky All Schedule Prescription Electronic Reporting System (KASPER), which tracks controlled substance prescriptions dispensed within the state.

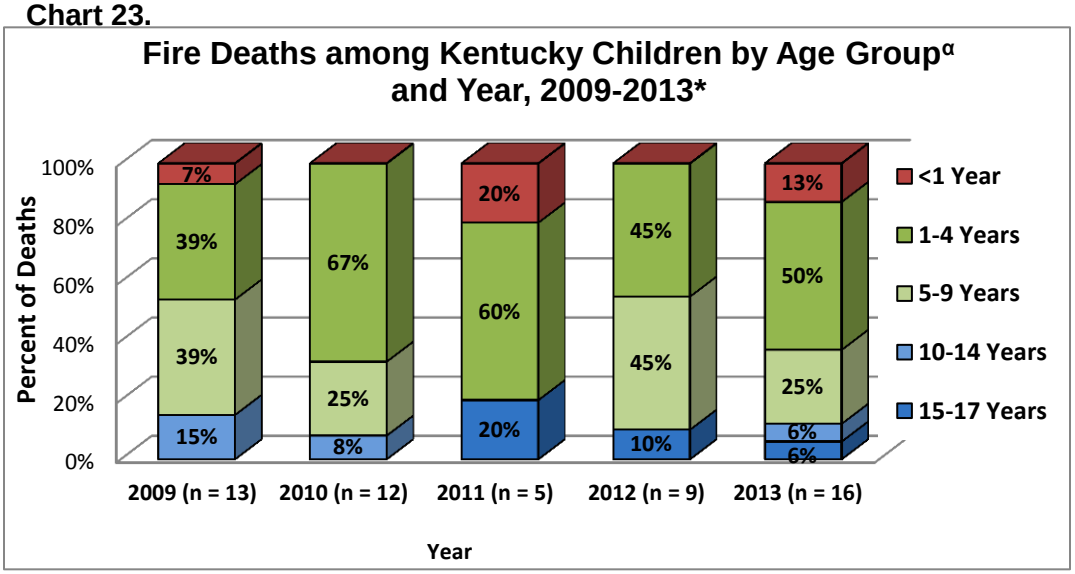
Child Deaths from Fires Increase for 2013

In an evaluation of the preliminary data for 2013, there is an increase in fire deaths among Kentucky children because of fires where multiple children died. Although the data for 2013 is not finalized and the numbers may change, the large number of reported fire deaths, thus far, that occurred among Kentucky's children in 2013 is worth noting here. Fire deaths among Kentucky children in 2013 were the highest in five years (Chart 23). While this increase is alarming, this is not a trend as fire deaths fluctuate each year. In the 2013 preliminary data, multiple child deaths occurred in single family homes that contained large families. Half (50%) of the deaths occurred among children ages 1 to 4. Risk factors nationally for deaths related to fires include living in rural areas, poverty, children 4 years of age younger and lack of or defective smoke detectors[14].

Every day in the U.S., at least one child dies from a home fire and every hour approximately 16 children are injured from fires or burns[34]. Over half (85%) of all fire-related deaths nationally are due to home fires, which spread rapidly and can leave families as little as two minutes to escape once an alarm sounds[34]. Nationally, 47% of children who died from fires or burns were ages four and under[9].

Working smoke alarms reduce the chance of dying in a reported home fire by half. Cooking equipment is the leading cause of home fires and home fire injuries, and most deadly fires occur at night[1]. Nationally, more than one-third (37%) of home structure fire deaths, and 29% of home fires occurred during the winter months of December, January, and February[1]. Prevention efforts should include targeting at-risk populations and educating parents and caretakers on fire safety.

Chart 23.



***Note: 2009-2013 data are preliminary and may change**

α **Note:** There was no statistically significant difference in the percentage of deaths by age group for 2013 compared to previous years

Data Source: Kentucky Vital Statistics, Death Certificate Files 2009-2013

COMMUNITY ACTIONS
Examples of Prevention Efforts

Prematurity and Infant Mortality Prevention

- Kentucky participates in the Region IV and VI Collaborative Improvement and Innovation Network (CoIIN) to reduce infant mortality. Strategies include reducing elective deliveries before 39 weeks gestation, expanding access to care for pregnant women and women of childbearing ages, promoting smoking cessation among pregnant women, reducing Sudden Infant Death Syndrome and Sudden Unexplained Infant Deaths by promoting safe sleep, and improving perinatal regionalization.
- The Department for Public Health has collaborated with several agencies and providers regarding Neonatal Abstinence Syndrome (NAS) to identify what measures we can take as a state to protect and improve the health of mothers and infants. The Kentucky legislature enacted KRS 211.676 to develop a data collection requirement to get a better understanding of the extent of the problem and to develop public health interventions based on the trends in the aggregate data. KRS 211.676, states *"all cases of neonatal abstinence syndrome (NAS) diagnosed among Kentucky resident births shall be reported to the Kentucky Department for Public Health by the facility where the NAS is diagnosed. The report shall be made at the time of the NAS diagnosis."* The Department for Public Health/Division of Maternal and Child Health (MCH) has developed a reporting system for healthcare providers and agencies to report cases of NAS in accordance with KRS 211.676.
- Text4baby is a free text messaging program that provides health messages during the prenatal and postpartum period, including messages focused on preterm birth prevention, maternal and infant nutrition, and safe sleep. The service is provided through a partnership of the National Healthy Mothers, Healthy Babies Coalition (HMHB), the Department of Health and Human Services and the White House Office of Science and Technology Policy. The Kentucky Department for Public Health (KDPH) is a national partner of Text4baby and promotes this program to the local health departments and healthcare providers to share with patients. The number of Kentuckians utilizing text4baby has increased from 6,557 users as of March 2013 to 9,652 users as of July 2014.

Sleep-related Infant Death Prevention

- Kentucky Local Health Departments (LHDs) are implementing "Safe Sleep" improvement projects to reduce infant mortality from unsafe sleep practices by educating new parents/caregivers on safe sleep, utilizing evidence-based practices, and providing current materials to teach prevention of infant deaths occurring during sleep through safe sleep environments. In 2013, seventeen LHD's also distributed "Safe Sleep Survival Kits" from Cribs for Kids, which included a Pack n' Play and other relevant safe sleep items, to families identified through the Health Access Nurturing Development Services (HANDS) or LHD staff, as needing assistance with providing a safe sleep environment for their infant.
- FREE updated "Safe to Sleep" educational presentations, brochures/teaching sheets, and door hangers are available for LHDs and other agencies to use with families to promote a safe sleep environment for infants. These materials may be obtained at: http://www.nichd.nih.gov/sts/Pages/default.aspx.
- Each local HANDS program received copies of the book *Sleep, Baby Safe and Snug* for each of the families in their program. This board book describes safe sleep habits in the form of a bedtime story. It is intended to remind parents of safe sleep practices at bedtime, when they are most helpful. The books and other parenting resources were provided in collaboration with the Charlie's Kids Foundation, whose aim is to raise awareness and support for SIDS by educating families, providing resources for parents, and promoting dialogue about SIDS and safe sleep practices.

Motor Vehicle Death Prevention

- In 2013, the Kentucky State Transportation Cabinet reported that Kentucky has 454 certified car seat technicians throughout the state to provide education and support for child passenger safety. Kentucky Injury Prevention Research Center (KIPRC) reports that 230 car seats were distributed to families in need in 2012 and 148 in 2013.
- KIPRC, on behalf of MCH, participated in the Children's Safety Network Rural Community of Practice. This virtual working group promotes motor vehicle collision prevention in rural areas and the sustainability of nationally certified child passenger safety workforce.
- In Kentucky, much of the transportation provided by day care centers (especially those serving low-income families) occurs in 15-passenger vans. In an effort to improve child passenger safety for those children who ride to daycare or before- or after- school programs on those vans, Kentucky State Safe Kids (supported with funding from DPH/MCH and with the assistance of Child Passenger Safety (CPS) technicians and instructors from across the state) embarked on a training program in 2010. This training from 2010 to the present has provided training for 394 people from 132 day care centers. Almost 600 harnessed car seats and booster seats, some purchased with federal stimulus funds at the start of this project, have been distributed to 106 of those centers, and this project is ongoing.

Child Maltreatment Prevention

- KDPH is the first state to implement the "Period of Purple Crying" program through local health departments and outside of a hospital setting. This program provides education to new parents regarding pediatric abusive head trauma (PAHT). Parents receive a DVD and booklet that provide information on soothing techniques, explain about the period during which an infant could have excessive crying, and relates the dangers of shaking an infant. In Kentucky, 50 LHD's have participated in the program reaching out to new parents through HANDS, Women, Infants, and Children (WIC), and other programs and to date have distributed approximately 10,400 "Period of Purple Crying" information packets to families.
- Prevent Child Abuse Kentucky (PCAK) funds parent education and parenting support programs throughout Kentucky utilizing a 12 week evidence based curricula. The goal is to produce behavioral changes in participants that will result in safety, well-being and permanency for children and families. During the state fiscal year 2013, there were 21 parent education and support group programs reporting over 14,700 incidents of parent education services to areas across Kentucky. PCAK is a provider of awareness and education throughout the Commonwealth.
- In 2013, the Kentucky General Assembly passed legislation creating an External Child Fatality/Near Fatality Review Panel. The group of 20 experts from across the state reviews deaths and near deaths suspected to be a result of abuse or neglect, with the goal of prevention and/or systems improvement. KDPH and PCAK staff has been named to the Panel. This partnership encourages a prevention focus along with collaboration between the Panel and the State Child Fatality Team housed within DPH.
- Hope for Tomorrow is an educational tool designed by the Kentucky Partnership to Eliminate Child Abuse for new parents and caregivers that explains the dangers and risks of shaking a baby, what to do for an infant that won't stop crying, and what to do in the event you feel frustrated with your newborn. Hope for Tomorrow was created in Kentucky and uses Kentucky families to demonstrate that the heartbreak of child abuse does not discriminate, but can and does touch every member of society. Hope for Tomorrow can be viewed at http://www.kosairchildrenshospital.com/hopefortomorrow.

Suicide Prevention

- During the 2013 legislative session, Kentucky became the second state in the nation to require mental health providers to participate in specific suicide prevention screening and risk assessment training on a regular basis. To meet the requirements of the state law, two-day certification training and follow-up trainings based on the SAMHSA High School Toolkit were created. The trainings certified school staff to provide suicide training and strongly encouraged use of evidence-based curriculum for the provision of information for youth.
- The Kentucky Division of Behavioral Health (DBH) continues suicide prevention gatekeeper training across the state, which is funded by a three year grant entitled Suicide Prevention Efforts for Adolescents in Kentucky (SPEAK). This federal Garrett Lee Smith (GLS) grant was awarded to DBH in August of 2011, from the Substance Abuse and Mental Health Services Administration for youth suicide prevention. There are currently more than 400 Question, Persuade and Refer (QPR) instructors across the state.
- Kentucky's Zero Suicide in Healthcare initiative is about organizations and systems working together to make suicide a "never event" in programs and systems of care that include emergency departments, medical-surgical units, primary care and general medical settings, behavioral health entities, crisis services, primary, secondary and post-secondary education, justice systems, workplaces, and, others. Collaborating with community mental health centers, regional forums occurred across the Commonwealth to open dialogue within and across various systems of care regarding continuity of care, increasing awareness and knowledge of suicide prevention, inform clinical practices, and ultimately save lives.
- In 2014, funds were provided to the DBH to implement a school-based screening tool in collaboration with the Kentucky Department of Education to intervene with at-risk youth before they enter the judicial or social services systems. There are six school districts participating in a demonstration project related to implementing the school-based behavioral health screenings to middle and high school-age youth. Trained staff at the demonstration sites uses the Global Appraisal of Individual Needs - Short Screener (GAIN SS) screening instrument to screen for behavioral health risks: including suicidality, depression, anxiety, substance abuse and other internalizing and externalizing behavioral health concerns. Screeners make referrals to appropriate mental health providers for children and families when behavioral health risks are noted for further evaluation.

Fires

- City and rural volunteer firefighters, in collaboration with KIPRC, installed 3,700+ smoke detectors during 2013 as part of the rural fire prevention and smoke detector installation program funded by the CDC/Federal Emergency Management Agency (FEMA).
- In March, 2014 the State Fire Marshall's Office held a Fire Summit, bringing together community leaders, local agencies and representatives from faith-based organizations to discuss fires and fire deaths. The Summit focused on target populations, risk factors, barriers to current prevention initiatives, and brainstorming new prevention activities involving the community.

Drowning

- The Kentucky American Academy of Pediatrics (KY AAP), in collaboration with the State Child Fatality Review Team, distributed information to pediatricians around the state to use in counseling parents about drownings. The goal was to provide physicians the most updated information about drowning prevention to share with the families they serve, thereby helping to prevent drowning deaths. This information was sent in April 2013 prior to the peak swimming and water recreation season when most drownings occur.

RECOMMENDATIONS

Based on a review of child fatality data for 2012 and related trend data, the Child Fatality Review State Team makes the following recommendations for the prevention of child deaths in Kentucky.

Recommendation # 1 - Safe Sleep: As reported, sleep related deaths are a leading cause of infant deaths. Recommendations for the prevention of sleep-related deaths follow:

- **A.** All birthing hospitals should model safe sleep practices in their nurseries[15, 21], and educate all families of newborns regarding national safe sleep practices recommended by the American Academy of Pediatrics.
- **B.** Healthcare providers, child care providers, and other community organizations may access the most current, cost-free and evidence-based Safe Sleep materials from the Eunice Kennedy Shriver National Institute of Child Health and Human Development to provide to their client populations to educate their communities and families about safe sleep practices. (http://www.nichd.nig.gove/SIDS/Pages/sids.aspx)

Recommendation # 2 - Motor Vehicle Collisions: Motor vehicle collisions are the leading cause of injury related deaths for children ages 1-17 years-old. Proper use of child passenger safety restraints reduces the risk of death.

- Medical providers, community service providers, and labor/delivery units should offer parents materials and education on the National Highway Traffic Safety Administration and American Academy of Pediatrics recommendations for appropriate child passenger safety seats and booster seats. This includes recommendations for children to remain in a rear facing seat until he/she reaches the top height or weight limit allowed by the infant seat's manufacturer. (http:www.safecar.gov/).

Recommendation # 3 - Child Maltreatment Prevention: Child maltreatment is a serious and ongoing issue across the nation. Younger children are particularly vulnerable and at risk for injuries and death from child maltreatment. Recommendations for child maltreatment prevention are:

- **A.** All Kentucky birthing hospitals should implement an evidence-based parent training program for pediatric abusive head trauma prevention for families of newborns. These programs can be provided at no or low cost, and have been proven to be effective in reducing the incidence of pediatric abusive head trauma in communities. Parents should be educated on acceptable and safe ways to deal with infant crying and ways to soothe a crying infant.
- **B.** Parenting classes in communities, regardless of the agency providing the classes, should include education on the current national recommendations for safe sleep, pediatric abusive head trauma prevention, the **TEN-4** Bruising Rule (which includes any bruising of the **T**orso, **E**ars, or **N**eck on children **4** years or younger and any bruising anywhere on infants 4 months and younger), as well as basic childhood development.

Recommendation # 4 – Suicide Prevention: Teen suicide rates are not declining and the number of younger children committing suicide is increasing. There are many factors associated with teen suicide. It is imperative that parents, educators and service providers from all systems of care that interact with children and youth are aware of the warning signs and are equipped to talk to children in crisis.

- **A.** Providers in both healthcare and behavioral healthcare have unique opportunities to screen and access for suicide risk and ensure that at risk youth receive competent suicide treatment and management within and across systems of care (zerosuicide.com).
- **B.** School systems should have protocols for addressing suicide, which include evidence-based screening tools and resources. (Substance Abuse and Mental Health Services Administration. Preventing Suicide: A Toolkit for High Schools. HHS Publication NO. SMA-12-4669. Rockville, MD: Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, 2012).

Recommendation # 5 – Drowning Prevention: Drowning is a leading cause of injury related death in Kentucky and nationally for one to four year-olds. Deaths from drowning are potentially preventable by:

- Parents/caretakers should understand the risk of drowning and should constantly supervise children, especially those 4 and under, around all water sources including pools, bathtubs, ponds, and areas of standing water. This information should be reinforced through anticipatory guidance at well child visits for children 4 years of age and younger, and should be emphasized beginning in the early spring months, which is prior to the start of the peak swimming and water recreation season.

RESOURCES

Free Trainings offered for Injury Prevention:

Continuing Education Program on Sudden Infant Death Syndrome (SIDS) Risk Reduction

The *Eunice Kennedy Shriver* National Institute of Child Health and Human Development and its partners developed a FREE continuing education (CE) program on SIDS risk reduction for nurses available at http://www.nichd.nih.gov/SIDS/Pages/sidsnursesce.aspx

Pharmacists can access this free continuing education (CE) activity, developed by the NICHD and its pharmacist partners, which explains the latest research on SIDS and SIDS risk reduction and outlines how pharmacists can help spread safe sleep messages to parents and caregivers in just a few minutes. http://www.nichd.nih.gov/SIDS/pages/PharmacistCE.aspx

Pediatric Abusive Head Training (Meets Kentucky State law requirements) and Child Maltreatment

Free 1 hour training on pediatric abusive head trauma (PAHT) training for physicians is offered at http://www.nortonhealthcare.com/pediatric-abusive-head-trauma.

Free online training for healthcare/other child care providers for PAHT, titled “Understanding Abusive Head Trauma”, course ID number 1029373 can be accessed at https://ky.train.org.

Medical Elements of Child Abuse and Neglect (MECAN) series on child abuse recognition & reporting found on course ID numbers 1013009, 1020913, and 1013010 accessed at https://ky.train.org. The MECAN series includes information on TEN-4 Bruising rule.

DEFINITION OF TERMS

Cause of Death – Event that causes a physical problem, no matter how brief or prolonged, that leads to a child's death. Categories for cause of death are injury deaths and non-injury deaths:

1. Injury Deaths – more likely to be preventable than non-injury deaths, including but not limited to: suffocation, poisoning, drowning, fire, child abuse, suicide, homicide, and vehicular collisions.
2. Non-Injury Deaths – deaths that are the result of natural processes such as disease, prematurity, or congenital anomalies (birth defects).

Child – A person between 0 and 17 years of age (all references to "child" in this report specify which age group/range is being discussed).

Disparity – Term used to describe the difference or inequity between two groups.
Example: If the infant death rate was lower in white infants compared to the infant death rate in all other races, a racial disparity exists because one racial group (all other races) has a higher rate of infant death compared to another racial group (white infants).

Infant – A person under 1 year of age.

Infant Mortality – Death of an infant before his or her first birthday.

Infant Mortality Rate – Number of infant deaths per 1,000 live births for a specified time period.

Rate – Measure that indicates how often an event is occurring during a certain time period; it is calculated by taking the count of an event during a specific time period and dividing this number by the population that is at risk for experiencing the event during the time period. Rates are often expressed in units of 10, such as per 100, per 1,000, or per 100,000.

Example: The infant death rate is expressed as the number of deaths that occurred among infants 1 to 364 days old who were born alive during a given year divided by the number of live births that occurred in the same year multiplied by 1,000. Therefore, if 200 infants died during 2011 and there were 16,000 live births during the same year, the infant death rate would be 12.5 deaths per 1,000 live births (calculated by taking 200 divided by 16,000 and multiplying by 1,000).

Sleep-Related Risk Factors – include the following risk factors: bed-sharing, use of sofa/couch or other surface not designed for infant sleep, soft bedding or presence of stuffed animals in sleep environment, use of an adult bed, and placed prone (on stomach) or side position; which can lead to an unsafe sleep environment.

Sudden Unexpected Infant Deaths (SUID) - defined as deaths in infants less than 1 year of age that occur suddenly and unexpectedly, and whose cause of death are not immediately obvious prior to investigation.

1. Sudden Infant Death Syndrome (SIDS): a sudden, unexplained death of an infant less than 1 year old. It is a diagnosis of exclusion, meaning that after an extensive review of the infant's medical history, a complete autopsy, and a death scene investigation no cause can be identified.
2. Accidental Suffocation in bed: a result of another person lying on the baby, wedging of the baby, or the baby's face in a soft surface such as a pillow, blanket, or bumper pad.
3. Undetermined: there is no anatomic, toxicological or metabolic cause of death but there is other compelling information, investigative omission, or physical evidence that is concerning and suggests that death was not a natural death.

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